Technical Support Document

for the

Louisiana Regional Haze State Implementation Plan

Docket ID: EPA-R06-OAR-2008-0510

February 2012

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Throughout this document wherever "we," "us," or "our" is used, we mean the Environmental Protection Agency (EPA).

Italics: For convenience, for each section of the outline in this technical support document (TSD), we include information from the Notice of Proposed Rulemaking in italicized text, with the exception of tables. Some non-substantive changes have been made to this text to facilitate reading of this TSD, including the renumbering of tables, as appropriate.

We note for the Appendices, each Appendix begins with page 1.

I. Executive Summary of Proposed Action

The EPA is proposing a partial limited approval of Louisiana's June 13, 2008, State Implementation Plan (SIP) revision addressing regional haze (RH) under the Clean Air Act (CAA) sections 301(a) and 110(k)(3) because certain provisions of the revision strengthen the Louisiana (LA) SIP. The EPA is also proposing a partial disapproval of the LA RH SIP submittal because the submittal includes several deficient provisions. The deficiencies identified in today's action go beyond those identified in the limited disapproval proposed on December 30, 2011 (76 FR 82219). Certain elements of the State's Best Available Retrofit Technology (BART) evaluations and determinations are not fully adequate to meet the federal requirements. Additionally, as a result of the deficiencies related to BART, the Long-Term Strategy (LTS) and Reasonable Progress Goals (RPGs) are not fully adequate to meet federal requirements. Finally, because visibility impacts from smoke are significant in Louisiana, we propose that Louisiana should finalize its Smoke Management Plan (SMP). The portions of the revision proposed for limited approval nevertheless represent an improvement over the current SIP, and make considerable progress in fulfilling the applicable CAA RH program requirements. The proposed rulemaking and this TSD explain the basis for EPA's proposed partial limited approval and partial disapproval.

Under CAA sections 301(a) and 110(k)(6) and EPA's long-standing guidance,[1] a limited approval results in approval of portions of the SIP submittal, even though they are deficient and prevent EPA from granting a full approval of the SIP revision. In an earlier proposed action, EPA has proposed a limited disapproval of Louisiana's RH SIP revision for not meeting all the applicable requirements of the CAA (76 FR 82219). In today's proposed action, having concluded based on a careful review of the LA RH SIP revision that there are deficiencies in the SIP beyond those identified in the proposed limited disapproval of the LA RH SIP, we are proposing a partial disapproval of those additional deficiencies and a partial limited approval of the rest of the LA RH SIP. The partial limited approval proposes to give limited approval to those portions of the SIP that are not being disapproved in today's action for their benefit in strengthening the SIP even though they do not fully meet regional haze requirements.

Specifically, we are proposing to find that the following elements of the submittal fully satisfy federal requirements insofar as the elements do not rely on the sulfur dioxide (SO_2) reductions from the Clean Air Interstate Rule (CAIR): the State's identification of affected Class I areas; the establishment of baseline, natural and current visibility conditions, including the Uniform Rate of Progress (URP); coordination of reasonably attributable visibility impairment (RAVI) and RH requirements; the RH monitoring strategy and other SIP requirements under Title 40 of the Code of Federal Regulations (denoted 40 CFR), Part 51.308(d)(4); the State's commitment to submit periodic RH SIP revisions and periodic progress reports describing progress towards the State's RPGs; the State's commitment to make a determination of the adequacy of the existing SIP at the time a progress report is submitted; and the State's coordination with Federal Land Managers (FLMs).

We are proposing to find that Louisiana's RPGs meet some federal requirements, but also contain some deficiencies. We are proposing to find that the State's RPGs are deficient given our proposed finding that certain of Louisiana's BART determinations are not fully approvable. In general, the State followed the requirements of 40 CFR 51.308(d)(1), but these

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[1] *Processing of State Implementation Plan (SIP) Revisions*, EPA Memorandum from John Calcagni, Director, Air Quality Management Division, OAQPS, to Air Division Directors, EPA Regional Offices I-X (1992 Calcagni Memorandum) located at http://www.epa.gov/ttn/caaa/t1/memoranda/siproc.pdf.

goals do not reflect appropriate emissions reductions from BART.

For LTS, we are proposing to find that the State's LTS satisfies many of the requirements under 40 CFR 51.308(d)(3); however, we are proposing to find that the submitted LTS is deficient because a portion of it relies on BART determinations that we are proposing to disapprove. Also, because visibility impacts from smoke are significant in Louisiana, we propose to find that that Louisiana should finalize its SMP.

For the BART analyses for sources other than electric generating units (EGUs), we are proposing to find that the State's identification of subject-to-BART sources meets federal requirements in part, but that the state should have identified the Mosaic facility as being subject to BART and made a BART determination for the source. This is discussed in more detail below and in section IV.D.2 of the proposal. We are also proposing to find that the BART determinations made by the Louisiana Department of Environmental Quality's (LDEQ) for Conoco Phillips, Rhodia, and Sid Richardson Carbon Black are not fully approvable. These BART determinations are discussed in more detail below and in section IV.D.3 of the proposal.

As noted above, in an earlier proposed action, the EPA proposed a limited disapproval of the Louisiana regional haze SIP. The EPA's proposed limited disapproval is based on deficiencies in the state's regional haze SIP submittal arising from the state's reliance on the CAIR to meet certain regional haze requirements. In the same December 30, 2011 notice, the EPA proposed to find that the Transport Rule,[2] a rule issued in 2011 to address the interstate transport of nitrogen oxides (NO_X) and SO_2 in the eastern United States would, like the CAIR, provide for greater reasonable progress towards the national goal than would BART. 76 FR 82219. Based on this proposed finding, the EPA also proposed to revise the Regional Haze Rule (RHR) to allow states to substitute participation in the trading programs under the Transport Rule for source-specific BART. This proposed revision applies only to EGUs in the states in the Transport Rule region and only to the pollutants subject to the requirements of the Transport Rule. States such as Louisiana that are subject to the requirements of the Transport Rule trading program only for NO_X must still address BART for EGUs for SO_2 and other visibility impairing pollutants. See, 76 FR at 82224. Consequently, while we proposed on December 30, 2011 to issue a federal implementation plan (FIP) to address the deficiencies in Louisiana's SIP associated with the BART requirements for NO_X for EGUs, we did not propose a plan to address the deficiencies associated with the BART requirements for SO_2. The docket for this earlier EPA proposed limited disapproval of Louisiana's regional haze SIP may be found at Docket ID No. EPA-HQ-OAR-2011-0729.

Louisiana also relied on the CAIR in assessing the need for emissions reductions from EGUs to ensure reasonable progress. Consequently, Louisiana will have to reconsider whether reductions of SO_2 from EGUs, whether subject to BART or not, are appropriate for ensuring reasonable progress.

Where a submittal addresses a mandatory requirement of the CAA, we must, within 24 months following a final disapproval, either approve a SIP or promulgate a FIP. CAA section 110(c)(1). At this time, we are not proposing a FIP for the portions of the Louisiana RH SIP we are proposing in this action to find deficient because the LDEQ has expressed its intent to revise the Louisiana RH SIP by correcting the deficiencies. We are electing to not propose a FIP at this time in order to provide Louisiana time to correct these deficiencies. However, a final partial disapproval of Louisiana's RH SIP will start the two-year mandatory FIP clock. If the State submits an approvable rule revision during the FIP clock period, final approval of the rule

[2] 76 FR 48208 (August 8, 2011).

revision correcting the deficiencies will terminate the FIP clock.

II. What is the Background for Our Proposed Actions?

Relationship of this TSD to our Proposal

This TSD is not meant to be a complete rationale for our decision. It merely provides additional information for some of the technical aspects of the basis for this action when needed. In some of the non-technical areas, our Federal Register (FR) notice provides more detail than does this TSD. Also, this TSD treats the requirements of 40 CFR 51.308 in the order in which they appear in the FR notice. The TSD also attempts to refer the reader to the specific portions of the Louisiana RH SIP submittal that we relied upon for our analysis of particular portions of 40 CFR 51.308.

Throughout this document, we often use language such as, "we find" or other similar phrases that on the surface would suggest a final determination has been made. However, all aspects of our TSD should be considered to be part of our proposal and are subject to change based on comments and other information we may receive during our public comment period.

This TSD contains several appendices that support our proposal. TSD Appendix A provides "Modeling and Emission Inventory Development; Review and Analysis for Louisiana's Regional Haze State Implementation Plan." TSD Appendix B provides the emissions for several units at ConocoPhillips. TSD Appendix C contains the emissions for Rhodia. TSD Appendix D provides the information which was used to develop Table 13: Percent Contribution from Louisiana Emissions to Total Visibility Impairment at Class I areas on 20% Worst Days. TSD Appendix E shows "Incidence of Biomass Burning in Louisiana."

A. The Regional Haze Problem

Regional haze is visibility impairment that is produced by a multitude of sources and activities which are located across a broad geographic area and emit fine particulate matter ($PM_{2.5}$) (e.g., sulfates, nitrates, organic carbon, elemental carbon, and soil dust), and their precursors (e.g., SO_2, NO_X, and in some cases, ammonia (NH_3) and volatile organic compounds (VOCs)). Fine particle precursors react in the atmosphere to form fine particulate matter that impairs visibility by scattering and absorbing light. Visibility impairment reduces the clarity, color, and visible distance that one can see. $PM_{2.5}$ can also cause serious health effects and mortality in humans and contributes to environmental effects such as acid deposition and eutrophication.

Data from the existing visibility monitoring network, the "Interagency Monitoring of Protected Visual Environments" (IMPROVE) monitoring network, show that visibility impairment caused by air pollution occurs virtually all the time at most national park and wilderness areas. The average visual range[3] in many Class I areas[4] (i.e., national parks and memorial parks, wilderness areas, and international parks meeting certain size criteria) in the

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[3] Visual range is the greatest distance, in kilometers or miles, at which a dark object can be viewed against the sky.

[4] Areas designated as mandatory Class I Federal areas consist of national parks exceeding 6,000 acres, wilderness areas and national memorial parks exceeding 5,000 acres, and all international parks that were in existence on August 7, 1977. See, 42 U.S.C. 7472(a). In accordance with section 169A of the CAA, the EPA, in consultation with the Department of Interior, promulgated a list of 156 areas where visibility is identified as an important value. See, 44 FR 69122, November 30, 1979. The extent of a mandatory Class I area includes subsequent changes in boundaries, such as park expansions. See, 42 U.S.C. 7472(a). Although states and tribes may designate as Class I additional areas which they consider to have visibility as an important value, the requirements of the visibility program set forth in section 169A of the CAA apply only to "mandatory Class I Federal areas." Each mandatory Class I Federal area is the responsibility of a "Federal Land Manager." See, 42 U.S.C. 7602(i). When the term "Class I area" is used in this action, it means a "mandatory Class I Federal area."

western United States is 100-150 kilometers, or about one-half to two-thirds of the visual range that would exist without anthropogenic air pollution. In most of the eastern Class I areas of the United States, the average visual range is less than 30 kilometers, or about one-fifth of the visual range that would exist under estimated natural conditions. See, 64 FR 35715, July 1, 1999.

The Regional Haze Rule (RHR) is codified at 40 CFR 51.308.

Congress adopted the visibility provisions to protect visibility in 156 Federal Class I areas, which include certain national parks, memorial parks, and wilderness areas over a certain size, and all international parks. These areas are defined at 40 CFR 81.400, are listed by state at 40 CFR 81.401-81.437, and are depicted in Figure 1. The only Class I area within Louisiana, the Breton National Wilderness Area, is depicted in Figure 2.

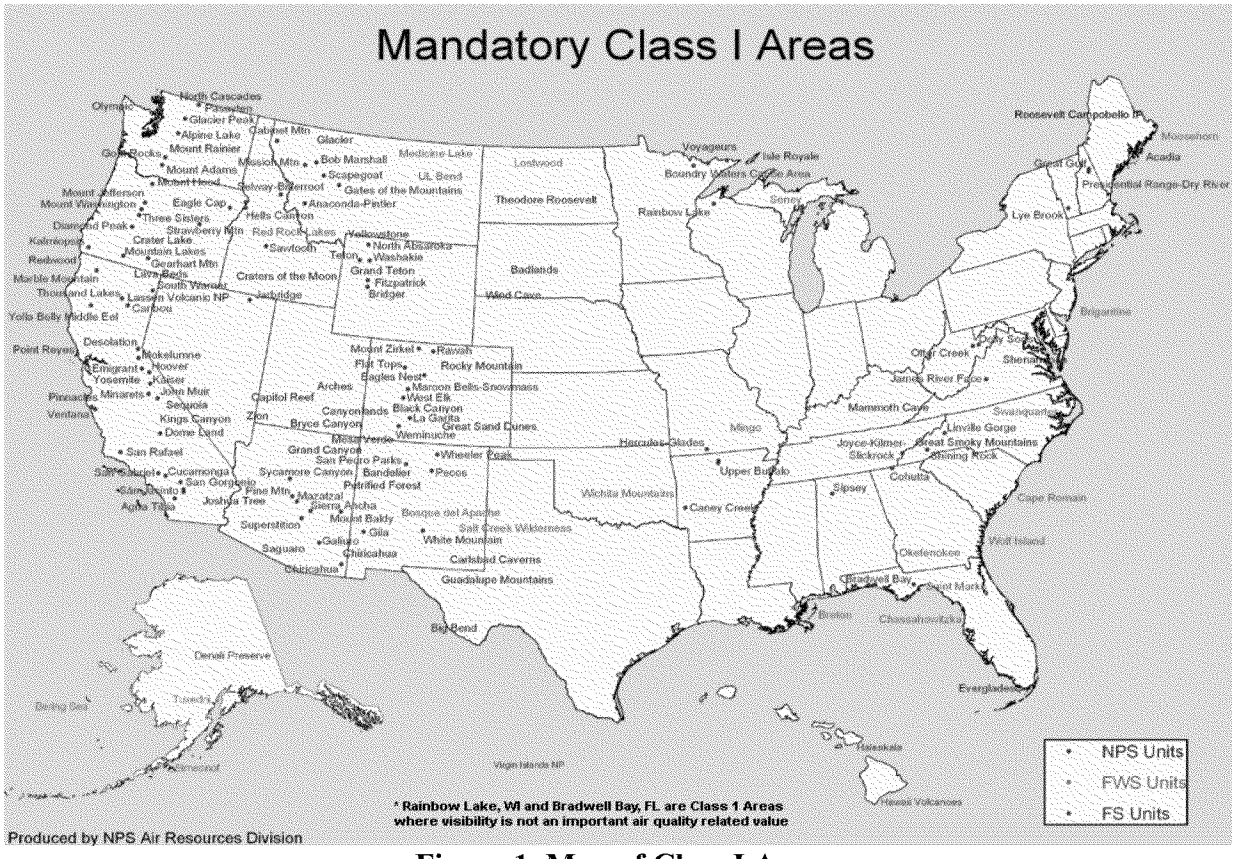

Figure 1. Map of Class I Areas

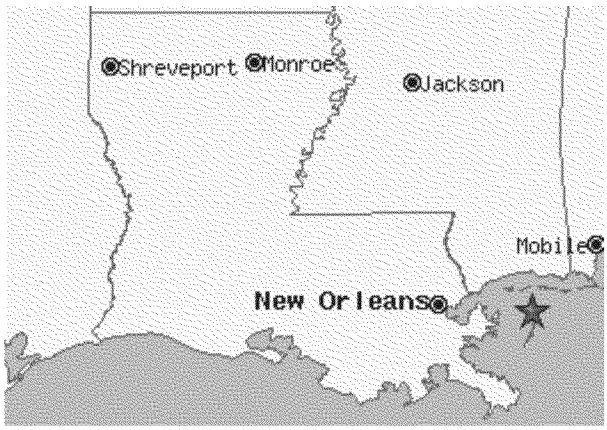

Figure 2. Location of the Class I Area, Breton National Wilderness Area in Louisiana

B. Requirements of the CAA and EPA's Regional Haze Rule (RHR)

In section 169A of the 1977 Amendments to the CAA, Congress created a program for protecting visibility in the nation's national parks and wilderness areas. This establishes as a national goal the "prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I Federal areas which impairment results from manmade air pollution." On December 2, 1980, the EPA promulgated regulations to address visibility impairment in Class I areas that is "reasonably attributable" to a single source or small group of sources, i.e., "reasonably attributable visibility impairment." 45 FR 80084. These regulations represented the first phase in addressing visibility impairment. The EPA deferred action on regional haze that emanates from a variety of sources until monitoring, modeling, and scientific knowledge about the relationships between pollutants and visibility impairment were improved.

Congress added section 169B to the CAA in 1990 to address regional haze issues. The EPA promulgated a rule to address regional haze on July 1, 1999 (64 FR 35713), the RHR. The RHR revised the existing visibility regulations to integrate into the regulation provisions addressing regional haze impairment and established a comprehensive visibility protection program for Class I areas. The requirements for regional haze, found at 40 CFR 51.308 and 51.309, are included in the EPA's visibility protection regulations at 40 CFR 51.300-309. Some of the main elements of the regional haze requirements are summarized below and in section III of the proposal. The requirement to submit a regional haze SIP applies to all 50 states, the District of Columbia, and the Virgin Islands.[5] *40 CFR 51.308(b) requires states to submit the first implementation plan addressing regional haze visibility impairment no later than December 17, 2007.*

In the 1990 Amendments to the CAA, Congress added Section 169B and called on us to issue RH rules. The RH rule that we promulgated on July 1, 1999 (64 FR 35714) revised the existing visibility regulations to integrate provisions addressing regional haze visibility impairment and establish a comprehensive visibility protection program for Federal Class I areas. These regulations represented the second phase in addressing visibility impairment. States were required to submit SIPs to us that set out each state's plan for complying with the RH Rule, including consultation and coordination with other states and with FLMs. States were required to

[5] Albuquerque/Bernalillo County in New Mexico must also submit a regional haze SIP to completely satisfy the requirements of section 110(a)(2)(D) of the CAA for the entire State of New Mexico under the New Mexico Air Quality Control Act (section 74-2-4).

submit a Regional Haze SIP to us within three years after the date of designation of areas under the National Ambient Air Quality Standard (NAAQS) for fine particulate matter ($PM_{2.5}$). We promulgated $PM_{2.5}$ designations on December 17, 2004, and thus, regional haze SIPs were to be submitted to us by December 17, 2007, which is also specified at 40 CFR 51.308(b). We received the Louisiana RH SIP on June 13, 2008.

C. Roles of Agencies in Addressing Regional Haze

Successful implementation of the RH program will require long-term regional coordination among states, tribal governments and various federal agencies. As noted above, pollution affecting the air quality in Class I areas can be transported over long distances, even hundreds of kilometers (km). Therefore, to address effectively the problem of visibility impairment in Class I areas, states need to develop strategies in coordination with one another, taking into account the effect of emissions from one jurisdiction on the air quality in another.

Because the pollutants that lead to RH can originate from sources located across broad geographic areas, we have encouraged the states and tribes across the United States (U.S.) to address visibility impairment from a regional perspective. Five regional planning organizations (RPOs) were developed to address RH and related issues. The RPOs first evaluated technical information to better understand how their states and tribes impact Class I areas across the country, and then pursued the development of regional strategies to reduce emissions of particulate matter and other pollutants leading to RH.

The Central Regional Air Planning Association (CENRAP) is an organization of states, tribes, federal agencies and other interested parties that identifies RH and visibility issues and develops strategies to address them. The CENRAP is one of the five RPOs across the U.S. and includes the states and tribal areas of Nebraska, Kansas, Oklahoma, Texas, Minnesota, Iowa, Missouri, Arkansas, and Louisiana.

The RH rule addressed the combined visibility effects of various pollution sources over a wide geographic region. Consequently, all 50 states, including those without Class I areas, Washington, D.C., and the Virgin Islands, were required to submit Regional Haze SIPs (40 CFR 51.300(b)(3)). We designated five RPOs to assist with the coordination and cooperation needed to address the visibility issue, as shown by Figure 3.

Figure 3. Map of Regional Planning Organization Boundaries

The CENRAP also includes federally recognized Indian tribes located within the geographic boundaries of its member states. Louisiana and its air pollution control agency, the LDEQ, chose to participate in the CENRAP to develop the technical analyses needed to fulfill the requirements of the RH Rule.

III. What are the Requirements for Regional Haze SIPs?

The following is a summary and basic explanation of the regulations covered under the RHR. See, 40 CFR 51.308 for a complete listing of the regulations under which this SIP is being evaluated.

A. The CAA and the Regional Haze Rule

RH SIPs must assure reasonable progress towards the national goal of achieving natural visibility conditions in Class I areas. Section 169A of the CAA and our implementing regulations require states to establish long-term strategies for making reasonable progress toward meeting this goal. Implementation plans must also give specific attention to certain stationary sources that were in existence on August 7, 1977, but were not in operation before August 7, 1962, and require these sources, where appropriate, to install BART controls for the purpose of eliminating or reducing visibility impairment. The specific RH SIP requirements are discussed in further detail below.

B. Determination of Baseline, Natural, and Current Visibility Conditions

The RHR establishes the deciview (dv) as the principal metric for measuring visibility.

See, 70 FR 39104 at 39118. *This visibility metric expresses uniform changes in the degree of haze in terms of common increments across the entire range of visibility conditions, from pristine to extremely hazy conditions. Visibility is sometimes expressed in terms of the visual range, which is the greatest distance, in kilometers or miles, at which a dark object can just be distinguished against the sky. The deciview is a useful measure for tracking progress in improving visibility, because each deciview change is an equal incremental change in visibility perceived by the human eye. Most people can detect a change in visibility of one deciview.* [6]

The deciview is used in expressing RPGs (which are interim visibility goals towards meeting the national visibility goal), defining baseline, current, and natural conditions, and tracking changes in visibility. The RH SIPs must contain measures that ensure "reasonable progress" toward the national goal of preventing and remedying visibility impairment in Class I areas caused by man-made air pollution by reducing anthropogenic emissions that cause RH. The national goal is a return to natural conditions, i.e., man-made sources of air pollution would no longer impair visibility in Class I areas.

To track changes in visibility over time at each of the 156 Class I areas covered by the visibility program (40 CFR 81.401-437), and as part of the process for determining reasonable progress, states must calculate the degree of existing visibility impairment at each Class I area at the time of each RH SIP submittal and periodically review progress every five years, midway through each 10-year implementation period. To do this, the RHR requires states to determine the degree of impairment (in deciviews) for the average of the 20 percent least impaired ("best") and 20 percent most impaired ("worst") visibility days over a specified time period at each of their Class I areas. In addition, states must also develop an estimate of natural visibility conditions for the purpose of comparing progress toward the national goal. Natural visibility is determined by estimating the natural concentrations of pollutants that cause visibility impairment and then calculating total light extinction based on those estimates. We have provided guidance to states regarding how to calculate baseline, natural and current visibility conditions. [7]

For the first RH SIPs that were due by December 17, 2007, "baseline visibility conditions" were the starting points for assessing "current" visibility impairment. Baseline visibility conditions represent the degree of visibility impairment for the 20 percent least impaired days and 20 percent most impaired days for each calendar year from 2000 to 2004. Using monitoring data for 2000 through 2004, states are required to calculate the average degree of visibility impairment for each Class I area, based on the average of annual values over the five-year period. The comparison of initial baseline visibility conditions to natural visibility conditions indicates the amount of improvement necessary to attain natural visibility, while the future comparison of baseline conditions to the then current conditions will indicate the amount of progress made. In general, the 2000 - 2004 baseline period is considered the time from which improvement in visibility is measured.

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[6] The preamble to the RHR provides additional details about the deciview. 64 FR 35714, 35725 (July 1, 1999).

[7] *Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule*, September 2003, EPA-454/B-03-005, *available* at http://www.epa.gov/ttncaaa1/t1/memoranda/rh_envcurhr_gd.pdf, (hereinafter referred to as "our 2003 Natural Visibility Guidance"); and *Guidance for Tracking Progress Under the Regional Haze Rule,*(EPA-454/B-03-004, September 2003, *available* at http://www.epa.gov/ttncaaa1/t1/memoranda/rh_tpurhr_gd.pdf, (hereinafter referred to as our "2003 Tracking Progress Guidance").

A deciview is a uniform measure of light extinction caused by regional haze. The deciview scale approaches zero for no visibility degradation and increases as visibility is degraded. The deciview scale was designed similar to the decibel scale for sound, so that equal changes in deciview are equally perceptible. Common current values in the west are 15 to 20 dv; common current values in the east are 25 to 30 dv.

In 2005, the IMPROVE Steering Committee made recommendations for a refined equation that modifies the terms of the original equation to account for the most recent data. The purpose of this refinement is to provide more accurate estimates of the various factors that affect the calculation of light extinction. The new IMPROVE equation estimates additive extinction coefficients for each of several chemical constituents of particulate matter: sulfurous, nitrate, organic carbonaceous, elemental "light-absorbing" carbonaceous, fine soil, chlorine or chloride, and coarse matter. The equation also accounts for Rayleigh scattering of light (due to atmospheric gases) and for deliquescence[8] on sulfurous, nitrate, and chlorine or chloride particulates with an estimate of particle-bound water as a function of relative humidity. It reflects the most recent review of the science[9] and it accounts for the effect of particle size distribution on light extinction efficiency of sulfate, nitrate, and organic carbon. It also adjusts the mass multiplier for organic carbon (particulate organic matter) by increasing it from 1.4 to 1.8. New terms are added to the equation to account for light extinction by sea salt and light absorption by gaseous nitrogen dioxide. Site-specific values are used for Rayleigh scattering to account for the site-specific effects of elevation and temperature. Separate relative humidity enhancement factors are used for small and large size distributions of ammonium sulfate and ammonium nitrate and for sea salt. The terms for the remaining contributors, elemental carbon (light-absorbing carbon), fine soil, and coarse mass terms, do not change between the original and new IMPROVE equations.

For each mandatory Class I Federal area located within the State, the State must determine the natural visibility conditions for the most impaired and least impaired days. Natural visibility conditions must be calculated by estimating the degree of visibility impairment existing under natural conditions for the most impaired and least impaired days, based on available monitoring information and appropriate data analysis techniques.

The period for establishing baseline visibility conditions is 2000 to 2004. Baseline visibility conditions must be calculated, using available monitoring data, by establishing the average degree of visibility impairment for the most and least impaired days for each calendar year from 2000 to 2004. The baseline visibility conditions are the average of these annual values. For mandatory Class I Federal areas without onsite monitoring data for 2000–2004, Louisiana must establish baseline values using the most representative available monitoring data for 2000–

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[8] Deliquescence: tending to melt or dissolve.

[9] An explanation of the revised IMPROVE equation is found in LA RH SIP, Appendix B, "Technical Support Document for the Central regional Air Planning Association (CENRAP)," and information regarding the science behind it can be found in numerous published papers. See for example: Hand, J.L., and Malm, W.C., 2006, *Review of the IMPROVE Equation for Estimating Ambient Light Extinction Coefficients - Final Report*. March 2006. Prepared for Interagency Monitoring of Protected Visual Environments (IMPROVE), Colorado State University, Cooperative Institute for Research in the Atmosphere, Fort Collins, Colorado. *http://vista.cira.colostate.edu/improve/publications/GrayLit/016_IMPROVEeqReview/IMPROVEeqReview.htm*; and Pitchford, Marc., 2006, *Natural Haze Levels II: Application of the New IMPROVE Algorithm to Natural Species Concentrations Estimates*. Final Report of the Natural Haze Levels II Committee to the RPO Monitoring/Data Analysis Workgroup. September 2006 *http://vista.cira.colostate.edu/improve/Publications/GrayLit/029_NaturalCondII/naturalhazelevelsIIrenatu.ppt*

2004, in consultation with the Administrator or his or her designee.

In establishing a reasonable progress goal for any mandatory Class I Federal area within the State, Louisiana must analyze and determine the rate of progress needed to attain natural visibility conditions by the year 2064. To calculate this rate of progress, Louisiana must compare baseline visibility conditions to natural visibility conditions in the mandatory Federal Class I area and determine the uniform rate of visibility improvement (measured in deciviews) that would need to be maintained during each implementation period[10] in order to attain natural visibility conditions by 2064.

C. Determination of Reasonable Progress Goals

The vehicle for ensuring continuing progress towards achieving the natural visibility goal is the submission of a series of RH SIPs from the states that establish two RPGs (i.e., two distinct goals, one for the "best" and one for the "worst" days) for every Class I area for each (approximately) 10-year implementation period. See, 70 FR 3915; See also 64 FR 35714. The RHR does not mandate specific milestones or rates of progress, but instead calls for states to establish goals that provide for "reasonable progress" toward achieving natural (i.e., "background") visibility conditions. In setting RPGs, states must provide for an improvement in visibility for the most impaired days over the (approximately) 10-year period of the SIP, and ensure no degradation in visibility for the least impaired days over the same period. Id.

States have significant discretion in establishing RPGs, but are required to consider the following factors established in section 169A of the CAA and in our RHR at 40 CFR 51.308(d)(1)(i)(A): (1) the costs of compliance; (2) the time necessary for compliance; (3) the energy and non-air quality environmental impacts of compliance; and (4) the remaining useful life of any potentially affected sources. States must demonstrate in their SIPs how these factors are considered when selecting the RPGs for the best and worst days for each applicable Class I area. States have considerable flexibility in how they take these factors into consideration, as noted in our Reasonable Progress Guidance.[11] *In setting the RPGs, states must also consider the rate of progress needed to reach natural visibility conditions by 2064 (the URP) and the emission reduction measures needed to achieve that rate of progress over the 10-year period of the SIP. Uniform progress towards achievement of natural conditions by the year 2064 represents a rate of progress, which states are to use for analytical comparison to the amount of progress they expect to achieve. In setting RPGs, each state with one or more Class I areas ("Class I State") must also consult with potentially "contributing states," i.e., other nearby states with emission sources that may be affecting visibility impairment at the Class I State's areas. 40 CFR 51.308(d)(1)(iv).*

For each mandatory Class I Federal area located within the state, Louisiana must establish goals (expressed in deciviews) that provide for reasonable progress towards achieving natural visibility conditions. The reasonable progress goals must provide for an improvement in visibility for the most impaired days over the period of the SIP and ensure no degradation in visibility for the least impaired days over the same period.

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[10] Each implementation period is 10 years, thus there are 6 implementation periods to attain natural visibility conditions by 2064.

[11] *Guidance for Setting Reasonable Progress Goals under the Regional Haze Program*, June 1, 2007, memorandum from William L. Wehrum, Acting Assistant Administrator for Air and Radiation, to EPA Regional Administrators, EPA Regions 1-10 (pp.4-2, 5-1).

In addition to this explicit regulatory requirement, the RHR also establishes an analytical requirement to ensure that each State considers carefully the suite of emission reduction measures necessary to attain the URP. The RHR provides that EPA will consider both the State's consideration of the four factors in 40 CFR 51.308(d)(1)(i)(A) and its analysis of the URP "[i]n determining whether the State's goal for visibility improvement provides for reasonable progress." 40 CFR 51.308(d)(1)(iii). As explained in the preamble to the RHR, the URP analysis was adopted to ensure that States use a common analytical framework and to ensure an informed and equitable decision making process to ensure a transparent process that would, among other things, ensure that the public would be provided with the information necessary to understand the emission reductions needed, the costs of such measures, and other factors associated with improvements in visibility. 64 FR 35714 at 35733. The preamble to the RHR also makes clear that the URP does not establish a "safe harbor" for the state in setting its progress goals, providing that after considering the four statutory factors under 40 CFR 51.308(d)(1)(iii), states may adopt RPGs that provide for greater, equal, or less visibility improvement than that represented by the URP 64 FR 35714 at 35732.

D. Best Available Retrofit Technology (BART)

Section 169A of the CAA directs states to evaluate the use of retrofit controls at certain larger, often uncontrolled, older stationary sources with the potential to emit greater than 250 tons per year (tpy) or more of any visibility impairing pollutant in order to address visibility impacts from these sources. Specifically, section 169A(b)(2)(A) of the Act requires states to revise their SIPs to contain such measures as may be necessary to make reasonable progress towards the natural visibility goal, including a requirement that certain categories of existing major stationary sources[12] built between 1962 and 1977 procure, install, and operate the "Best Available Retrofit Technology", as determined by the state or us in the case of a plan promulgated under section 110(c) of the CAA. Under the RHR, states are directed to conduct BART determinations for such "BART-eligible" sources that may be anticipated to cause or contribute to any visibility impairment in a Class I area. Rather than requiring source-specific BART controls, states also have the flexibility to adopt an emissions trading program or other alternative program as long as the alternative provides greater reasonable progress towards improving visibility than BART.

We promulgated regulations addressing RH in 1999, 64 FR 35714 (July 1, 1999), codified at 40 CFR part 51, subpart P.[13] These regulations require all states to submit implementation plans that, among other measures, contain either emission limits representing BART for certain sources constructed between 1962 and 1977, or alternative measures that provide for greater reasonable progress than BART. 40 CFR 51.308(e).

On July 6, 2005, we published the Guidelines for BART Determinations Under the Regional Haze Rule at Appendix Y to 40 CFR Part 51 ("BART Guidelines") to assist states in determining which of their sources should be subject to the BART requirements and in determining appropriate emission limits for each applicable source. 70 FR 39104. In making a BART determination for a fossil fuel-fired electric generating plant with a total generating capacity in excess of 750 megawatts (MW), a state must use the approach set forth in the BART

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[12] The set of "major stationary sources" potentially subject to BART are listed in CAA section 169A(g)(7).

[13] In *American Corn Growers Ass'n v. EPA*, 291 F.3d 1 (D.C. Cir. 2002), the U.S Court of Appeals for the District of Columbia Circuit issued a ruling vacating and remanding the BART provisions of the regional haze rule. In 2005, we issued BART guidelines to address the court's ruling in that case. *See* 70 FR 39104 (July 6, 2005).

Guidelines. A state is encouraged, but not required, to follow the BART Guidelines in making BART determinations for other types of sources; however, all subject to BART sources are required to comply with the five BART factors (or steps) (40 CFR 51.308(e)(1)(ii)(A)).

The process of establishing BART emission limitations can be logically broken down into three steps: first, states identify those sources that meet the definition of "BART-eligible source" set forth in 40 CFR 51.301;[14] *second, states determine whether each identified source "emits any air pollutant which may reasonably be anticipated to cause or contribute to any impairment of visibility in any such area" (a source that fits this description is "subject to BART,") and; third, for each source subject to BART, states then identify the appropriate type and the level of control for reducing emissions.*

States must address all visibility-impairing pollutants emitted by a source in the BART determination process. The most significant visibility impairing pollutants are SO_2, NO_X, and PM. We have stated that states should use their best judgment in determining whether VOC or ammonia compounds impair visibility in Class I areas.

Under the BART Guidelines, states may select an exemption threshold value for their BART modeling, below which a BART-eligible source would not be expected to cause or contribute to visibility impairment in any Class I area. The state must document this exemption threshold value in the SIP and must state the basis for its selection of that value. States have three options for exempting a BART-eligible source from the BART requirements, including dispersion modeling demonstrating that the source cannot reasonably be anticipated to cause or contribute to visibility impairment in a Class I area, use of model plants to exempt sources with common characteristics, and cumulative modeling to show that no sources in Louisiana are subject to BART. Any source with emissions that model above the threshold value would be subject to a BART determination review. The BART Guidelines acknowledge varying circumstances affecting different Class I areas. States should consider the number of emission sources affecting the Class I areas at issue and the magnitude of the individual sources' impacts. Any exemption threshold set by the state should not be higher than 0.5 dv. See also, 40 CFR part 51, Appendix Y, section III.A.1.

In their SIPs, states must identify potential BART sources, described as "BART-eligible sources" in the RHR, and document their BART control determination analyses. The term "BART-eligible source" used in the BART Guidelines means the collection of individual emission units at a facility that together comprises the BART-eligible source. In making BART determinations, section 169A(g)(2) of the CAA requires that states consider the following factors: (1) the costs of compliance; (2) the energy and non-air quality environmental impacts of compliance; (3) any existing pollution control technology in use at the source; (4) the remaining useful life of the source; and (5) the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology. States are free to determine the weight and significance to be assigned to each factor. See, 40 CFR 51.308(e)(1)(ii).

A RH SIP must include source-specific BART emission limits and compliance schedules for each source subject to BART (See, CAA section 169A(b)(2), 40 CFR 51.308(e), and 64 FR 35714, 35741). Once a state has made its BART determination, the BART controls must be installed and in operation as expeditiously as practicable, but no later than five years after the date of our approval of the RH SIP. CAA section 169(g)(4) and 40 CFR 51.308(e)(1)(iv). In

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[14] BART-eligible sources are those sources that have the potential to emit 250 tons or more of a visibility-impairing air pollutant, were put in place between August 7, 1962 and August 7, 1977, and whose operations fall within one or more of 26 specifically listed source categories.

addition to what is required by the RHR, general SIP requirements mandate that the SIP must also include all regulatory requirements related to monitoring, recordkeeping, and reporting for the BART controls on the source. See, CAA section 110(a).

As noted above, the RHR allows states to implement an alternative program in lieu of BART so long as the alternative program can be demonstrated to achieve greater reasonable progress toward the national visibility goal than would BART. Under regulations issued in 2005 revising the RH program, the EPA made just such a demonstration for the CAIR. See, 70 FR 39104 (July 6, 2005). The EPA's regulations provide that states participating in the CAIR cap-and-trade program under 40 CFR part 96 pursuant to an EPA-approved CAIR SIP or which remain subject to the CAIR FIP in 40 CFR part 97 need not require affected BART-eligible EGUs to install, operate, and maintain BART for emissions of SO_2 and NO_X. See, 40 CFR 51.308(e)(4). Because the CAIR did not address direct emissions of PM, states were still required to conduct a BART analysis for PM emissions from EGUs subject to BART for that pollutant. The CAIR required controls of both SO_2 and NO_X in Louisiana. Challenges to the CAIR, however, resulted in the remand of the rule to the EPA. See, North Carolina v. EPA, 550 F.3d 1176 (D.C. Cir. 2008). The EPA issued the Transport Rule in 2011 to address the interstate transport of NO_X and SO_2 in the eastern United States. See, 76 FR 48208 (August 8, 2011). On December 30, 2011, the EPA proposed to find that the trading programs in the Transport Rule would achieve greater reasonable progress towards the national goal than would BART in the states in which the Transport Rule applies. 76 FR 82219. Based on this proposed finding, the EPA also proposed to revise the RHR to allow states to substitute participation in the trading programs under the Transport Rule for source-specific BART. The transport rule requires control of NO_X during the ozone season in Louisiana. It does not, however, require control of SO_2. The EPA has not taken final action on that rule.

Modeling Methodology

The BART Guidelines provide that states may choose to use the CALPUFF[15] modeling system or another appropriate model to predict the visibility impacts from a single source on a Class I area and to therefore, determine whether an individual source is anticipated to cause or contribute to impairment of visibility in Class I areas, i.e., "is subject to BART." The Guidelines state that we believe CALPUFF is the best regulatory modeling application currently available for predicting a single source's contribution to visibility impairment (70 FR 39162). The LDEQ used the CALPUFF modeling system to determine whether individual sources in Louisiana were subject to or exempt from BART.

The BART Guidelines also recommend that states develop a modeling protocol for making individual source attributions, and suggest that states may want to consult with us and their RPO to address any issues prior to modeling. The CENRAP states, including Louisiana, developed the "CENRAP BART Modeling Guidelines."[16] Stakeholders, including the EPA,

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[15] Note that our reference to CALPUFF encompasses the entire CALPUFF modeling system, which includes the CALMET, CALPUFF, and CALPOST models and other pre and post processors. The different versions of CALPUFF have corresponding versions of CALMET, CALPOST, etc. which may not be compatible with previous versions (e.g., the output from a newer version of CALMET may not be compatible with an older version of CALPUFF). The different versions of the CALPUFF modeling system are *available* from the model developer at *http://www.src.com/verio/download/download.htm*.

[16] CENRAP BART Modeling Guidelines, T. W. Tesche, D. E. McNally, and G. J. Schewe (Alpine Geophysics LLC), December 15, 2005, *available* at http://www.deq.state.ok.us/aqdnew/RulesAndPlanning/Regional_Haze/SIP/Appendices/index.htm.

FLMs, industrial sources, trade groups, and other interested parties, actively participated in the development and review of the CENRAP protocol. The CENRAP provided readily available modeling databases for use by states to conduct their analyses. We note that the original meteorological databases generated by the CENRAP did not include observations as the EPA guidance recommends, therefore sources were evaluated using the 1st High values instead of the 8th High values. The use of the 1st High modeling values was agreed to by the EPA, representatives of the FLMs, and the CENRAP stakeholders.

E. Long-Term Strategy (LTS)

Consistent with the requirement in section 169A(b) of the CAA that states include in their RH SIP a 10 to 15-year strategy for making reasonable progress, 40 CFR 51.308(d)(3) of the RHR requires that states include a LTS in their RH SIPs. The LTS is the compilation of all control measures a state will use during the implementation period of the specific SIP submittal to meet any applicable RPGs. The LTS must include "enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals" for all Class I areas within, or affected by emissions from, the state. 40 CFR 51.308(d)(3).

When a state's emissions are reasonably anticipated to cause or contribute to visibility impairment in a Class I area located in another state, the RHR requires the impacted state to coordinate with the contributing states in order to develop coordinated emissions management strategies. 40 CFR 51.308(d)(3)(i). Also, a state with a Class I area impacted by emissions from another state must consult with such contributing state, (id.) and must also demonstrate that it has included in its SIP all measures necessary to obtain its share of emission reductions needed to meet the reasonable progress goals for the Class I area. Id. at (d)(3)(ii). The RPOs have provided forums for significant interstate consultation, but additional consultations between states may be required to sufficiently address interstate visibility issues. This is especially true where two states belong to different RPOs.

States should consider all types of anthropogenic sources of visibility impairment in developing their LTS, including stationary, minor, mobile, and area sources. At a minimum, states must describe how each of the following seven factors listed below are taken into account in developing their LTS: (1) emission reductions due to ongoing air pollution control programs, including measures to address RAVI; (2) measures to mitigate the impacts of construction activities; (3) emissions limitations and schedules for compliance to achieve the RPG; (4) source retirement and replacement schedules; (5) smoke management techniques for agricultural and forestry management purposes including plans as currently exist within the state for these purposes; (6) enforceability of emissions limitations and control measures; and (7) the anticipated net effect on visibility due to projected changes in point, area, and mobile source emissions over the period addressed by the LTS. 40 CFR 51.308(d)(3)(v).

F. Coordinating Regional Haze and Reasonably Attributable Visibility Impairment (RAVI)

As part of the RHR, we revised 40 CFR 51.306(c) regarding the LTS for RAVI to require that the RAVI plan must provide for a periodic review and SIP revision not less frequently than every three years until the date of submission of the state's first plan addressing RH visibility impairment, which was due December 17, 2007, in accordance with 40 CFR 51.308(b) and (c).

On or before this date, the state must revise its plan to provide for review and revision of a coordinated LTS for addressing RAVI and RH, and the state must submit the first such coordinated LTS with its first RH SIP. Future coordinated LTS and periodic progress reports evaluating progress towards RPGs, must be submitted consistent with the schedule for SIP submission and periodic progress reports set forth in 40 CFR 51.308(f) and (g), respectively. The periodic review of a state's LTS must report on both RH and RAVI and must be submitted to us as a SIP revision.

G. Monitoring Strategy and Other SIP Requirements

40 CFR 51.308(d)(4) of the RHR includes the requirement for a monitoring strategy for measuring, characterizing, and reporting of RH visibility impairment that is representative of all mandatory Class I Federal areas within the state. The strategy must be coordinated with the monitoring strategy required in 40 CFR 51.305 for RAVI. Compliance with this requirement may be met through "participation" in the IMPROVE network, i.e., review and use of monitoring data from the network. The monitoring strategy is due with the first RH SIP, and it must be reviewed every five years. The monitoring strategy must also provide for additional monitoring sites if the IMPROVE network is not sufficient to determine whether RPGs will be met.

The SIP must provide for the following, pursuant to 40 CFR 51.308(d)(4)(i)-(vi):

(i) The establishment of any additional monitoring sites or equipment needed to assess whether reasonable progress goals to address regional haze for all mandatory Class I Federal areas within Louisiana are being achieved.

(ii) Procedures by which monitoring data and other information are used in determining the contribution of emissions from within Louisiana to regional haze visibility impairment at mandatory Class I Federal areas both within and outside the State.

(iii) For a State with no mandatory Class I Federal areas, procedures by which monitoring data and other information are used in determining the contribution of emissions from within the State to regional haze visibility impairment at mandatory Class I Federal areas in other States.

(iv) The SIP must provide for the reporting of all visibility monitoring data to the Administrator at least annually for each mandatory Class I Federal area in the State. To the extent possible, Louisiana should report visibility monitoring data electronically.

(v) A statewide inventory of emissions of pollutants that are reasonably anticipated to cause or contribute to visibility impairment in any mandatory Class I Federal area. The inventory must include emissions for a baseline year, emissions for the most recent year for which data are available, and estimates of future projected emissions. The State must also include a commitment to update the inventory periodically.

(vi) Other elements, including reporting, recordkeeping, and other measures, necessary to assess and report on visibility.

The RHR requires control strategies to cover an initial implementation period extending to the year 2018, with a comprehensive reassessment and revision of those strategies, as appropriate, every 10 years thereafter. Periodic SIP revisions must meet the core requirements of 40 CFR 51.308(d) with the exception of BART. The requirement to evaluate sources for BART applies only to RH SIPs that address the first implementation period. See, 40 CFR 51.308(f). Facilities subject to BART must continue to comply with the BART provisions of 40 CFR 51.308(e), as noted above. Periodic SIP revisions will assure that the statutory requirement of reasonable progress will continue to be met.

H. Coordination with Federal Land Managers

The RHR requires that states consult with FLMs before adopting and submitting their SIPs. 40 CFR 51.308(i). States must provide FLMs an opportunity for consultation, in person and at least 60 days prior to holding any public hearing on the SIP. This consultation must include the opportunity for the FLMs to discuss their assessment of impairment of visibility in any Class I area and to offer recommendations on the development of the RPGs and on the development and implementation of strategies to address visibility impairment. Further, a state must include in its SIP a description of how it addressed any comments provided by the FLMs. Finally, a SIP must provide procedures for continuing consultation between the state and FLMs regarding the state's visibility protection program, including development and review of SIP revisions, five-year progress reports, and the implementation of other programs having the potential to contribute to impairment of visibility in Class I areas.

The SIP must provide for the following, pursuant to 40 CFR 51.308(i)(1)-(4):

(1) By November 29, 1999, Louisiana must identify in writing to the FLMs the title of the official to which the FLM of any mandatory Class I Federal area can submit any recommendations on the implementation of this subpart including, but not limited to:

(i) Identification of impairment of visibility in any mandatory Class I Federal area(s); and

(ii) Identification of elements for inclusion in the visibility monitoring strategy required by 40 CFR 51.305 and this section.

(2) Louisiana must provide the Federal Land Manager with an opportunity for consultation, in person and at least 60 days prior to holding any public hearing on a SIP (or plan revision) for regional haze required by this subpart. This consultation must include the opportunity for the affected FLMs to discuss their:

(i) Assessment of impairment of visibility in any mandatory Class I Federal area; and

(i) Recommendations on the development of the reasonable progress goal and on the development and implementation of strategies to address visibility impairment.

(3) In developing any SIP (or plan revision), Louisiana must include a description of how it addressed any comments provided by the FLMs.

(4) The SIP (or SIP revision) must provide procedures for continuing consultation between Louisiana and Federal Land Manager(s) on the implementation of the visibility protection program required by this subpart, including development and review of SIP revisions and 5-year progress reports, and on the implementation of other programs having the potential to contribute to impairment of visibility in mandatory Class I Federal areas.

I. Periodic SIP Revisions and Five-year Progress Reports

The SIP must provide for the following, pursuant to 40 CFR 51.308(f) and (g):

40 CFR 51.308(f): Each state identified in 40 CFR 51. 300(b)(3), which includes Louisiana, must revise and submit its regional haze SIP revision to the EPA by July 31, 2018 and every ten years thereafter. In each SIP revision, Louisiana must evaluate and reassess all of the elements required in paragraph (d) of this section, taking into account improvements in monitoring data collection and analysis techniques, control technologies, and other relevant factors. In evaluating and reassessing these elements, Louisiana must address the following:

(1) Current visibility conditions for the most impaired and least impaired days, and actual progress made towards natural conditions during the previous implementation period. The period for calculating current visibility conditions is the most recent five year period preceding the required date of the SIP submittal for which data are available. Current visibility conditions must be calculated based on the annual average level of visibility impairment for the most and least impaired days for each of these five years. Current visibility conditions are the average of these annual values.

(2) The effectiveness of the long-term strategy for achieving reasonable progress goals over the prior implementation period(s); and

(3) Affirmation of, or revision to, the reasonable progress goal in accordance with the procedures set forth in paragraph (d)(1) of this section. If Louisiana established a reasonable progress goal for the prior period which provided a slower rate of progress than that needed to attain natural conditions by the year 2064, it must evaluate and determine the reasonableness, based on the factors in paragraph (d)(1)(i)(A) of this section, of additional measures that could be adopted to achieve the degree of visibility improvement projected by the analysis contained in the first SIP described in paragraph (d)(1)(i)(B) of this section.

40 CFR 51.308(g): Each state identified in 40 CFR 51. 300(b)(3), which includes Louisiana, must submit a report to the Administrator every 5 years evaluating progress towards the reasonable progress goal for each mandatory Class I Federal area located within it and in each mandatory Class I Federal area located outside it which may be affected by emissions from within it. The first progress report is due 5 years from submittal of the initial SIP addressing paragraphs (d) and (e) of this section. The progress reports must be in the form of SIP

revisions that comply with the procedural requirements of 40 CFR 51.102 and 40 CFR 51.103. Periodic progress reports must contain at a minimum the following elements:

(1) A description of the status of implementation of all measures included in the SIP for achieving reasonable progress goals for mandatory Class I Federal areas both within and outside of Louisiana.

(2) A summary of the emissions reductions achieved throughout Louisiana through implementation of the measures described in paragraph (g)(1) of this section.

(3) For each mandatory Class I Federal area within Louisiana, it must assess the following visibility conditions and changes, with values for most impaired and least impaired days expressed in terms of 5-year averages of these annual values.

(i) The current visibility conditions for the most impaired and least impaired days;

(ii) The difference between current visibility conditions for the most impaired and least impaired days and baseline visibility conditions;

(iii)The change in visibility impairment for the most impaired and least impaired days over the past 5 years;

(4) An analysis tracking the change over the past 5 years in emissions of pollutants contributing to visibility impairment from all sources and activities within Louisiana. Emissions changes should be identified by type of source or activity. The analysis must be based on the most recent updated emissions inventory, with estimates projected forward as necessary and appropriate, to account for emissions changes during the applicable 5-year period.

(5) An assessment of any significant changes in anthropogenic emissions within or outside of Louisiana that have occurred over the past 5 years that have limited or impeded progress in reducing pollutant emissions and improving visibility.

(6) An assessment of whether the current SIP elements and strategies are sufficient to enable Louisiana, or other States with mandatory Federal Class I areas affected by emissions from it, to meet all established reasonable progress goals.

(7) A review of the Louisiana visibility monitoring strategy and any modifications to the strategy as necessary.

J. Determination of Adequacy of Existing Implementation Plan

The SIP must provide for the following, pursuant to 40 CFR 51.308(h):

At the same time Louisiana is required to submit any 5-year progress report to us in accordance with paragraph (g) of this section, it must also take one of the following actions based upon the information presented in the progress report:

(1) If Louisiana determines that the existing SIP requires no further substantive revision at this time in order to achieve established goals for visibility improvement and emissions reductions, it must provide to the Administrator a declaration that further revision of the existing SIP is not needed at this time.

(2) If Louisiana determines that the SIP is or may be inadequate to ensure reasonable progress due to emissions from sources in another state(s) which participated in a regional planning process, then Louisiana must provide notification to the Administrator and to the other state(s) which participated in the regional planning process. Louisiana must also collaborate with the other state(s) through the regional planning process for the purpose of developing additional strategies to address the plan's deficiencies.

(3) Where Louisiana determines that the SIP is or may be inadequate to ensure reasonable progress due to emissions from sources in another country, it shall provide notification, along with available information, to the Administrator.

(4) Where Louisiana determines that the SIP is or may be inadequate to ensure reasonable progress due to emissions from sources within the State, then Louisiana shall revise its SIP to address the plan's deficiencies within one year.

IV. Our Analysis of Louisiana's Regional Haze SIP

In evaluating the Louisiana RH SIP, we reviewed all the parts of the submittal, including the body of the SIP itself, and all appendices. In addition, we drew upon the following additional documents that may not have been specifically discussed in our TSD and/or the FR publication(s) of our decision:

1. 40 CFR Part 51: Requirements for Preparation, Adoption, and Submittal of Implementation Plans.
2. 40 CFR Part 51, Appendix V: Criteria for Determining the Completeness of Plan Submissions.
3. The "BART Guidelines" in 40 CFR Part 51, Appendix Y: Guidelines for BART Determinations.
   Under the Regional Haze Rule, 70 FR 39104, July 6, 2005.
4. Guidance for Tracking Progress Under the Regional Haze Rule, EPA-454/B-03-004, September, 2003.
5. Guidance for Demonstrating Attainment of Air Quality Goals for $PM_{2.5}$ and Regional Haze, January 2, 2001.
6. Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule, EPA-454/B-03-005, September 2003.
7. The "Baseline Memo," which is entitled, "2002 Base Year Emission Inventory SIP Planning: 8-Hour Ozone, $PM_{2.5}$ and Regional Haze Programs, dated 11/18/2002, from Lydia Wegman to the Regional Air Directors."

8. Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program, dated June 1, 2007.
9. Visibility Monitoring Guidance, EPA-454/R-99-003, June 1999.
10. Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations, EPA-454/R-05-001, dated August, 2005.
11. Interim Air Quality Policy on Wildland and Prescribed Fires, April 23, 1998.
12. "Processing of State Implementation Plan (SIP) Submittals," EPA Memorandum from John Calcagni, Director, Air Quality Management Division, OAQPS, to the Regional Air Directors, undated; released July 21, 1992.

A. Identification of Affected Class I Areas

As required by 40 CFR 51.308(d) of the RHR, the State of Louisiana has identified one Class I area within its borders, Breton National Wilderness Area (Breton NWA, or Breton). Part of a long chain of barrier islands, the area comprises a small part of the Breton National Wildlife Refuge located in the Breton Sound off the southeast coast of Louisiana. Breton NWA was identified by the LDEQ in its SIP. The FLM for Breton NWA is the U.S. Fish and Wildlife Service (USFWS) a bureau within the U.S. Department of Interior. The Louisiana RH SIP establishes RPGs for Breton and a LTS to achieve these goals within the first RH implementation period ending in 2018.

In developing its SIP, the LDEQ also considered whether Louisiana emissions from Louisiana sources impact visibility at Class I areas outside of the state and determined that Louisiana emissions do not cause or contribute to visibility impairment at Class I areas outside the State. Class I areas outside of Louisiana that were considered by the LDEQ included the 14,460 acre Caney Creek Wilderness Area in southwest Arkansas. In other parts of its SIP, the LDEQ does examine the impact of Louisiana's emissions on the visibility at other Class I areas as well.

We propose to find that the LDEQ correctly identified the Breton Class I area in Louisiana, and other Class I areas outside of its borders that may be impacted by emissions from Louisiana sources.

The CENRAP regional modeling has shown that, at the present time, facilities in Louisiana have little impact on the worst visibility days in the Caney Creek Area.[17] The FLM for the Caney Creek area in Arkansas is the U.S. Department of Agriculture (USDA) Forest Service. As discussed in section IV.C.3 of this TSD, the LDEQ consulted with state air quality agencies in surrounding states, including Arkansas, to determine what impact its emissions might have on the other states' Class I areas.

B. Determination of Baseline, Natural and Current Visibility Conditions

As required by 40 CFR 51.308(d)(2)(i) of the RHR and in accordance with the EPA's Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule,

[17] LA RH SIP TSD, Appendix B Section 5.4.3.1: Technical Support Document for CENRAP Emissions, And Air Quality Modeling to Support Regional Haze, State Implementation Plans, Appendix E, CAMx PM Source Apportionment Technology (PSAT), Extinction (Mm-1) Contributions for the 2002 Worst and Best 20 Percent Days at CENRAP Class I Areas, Figure E-1: Caney Creek Wilderness Area (CACR), Arkansas.

("Visibility Guidance"),[18] the LDEQ calculated baseline/current[19] and natural visibility conditions for Breton NWA on the most impaired and least impaired days, as summarized below.

Note: 40 CFR 51.308(d)(2)(ii) is not applicable because this SIP was submitted after 2003, and 40 CFR 51.308(d)(2)(iv)(B) is not applicable because this is the first SIP period.

- Estimating Natural Visibility Conditions
- Estimating Baseline Visibility Conditions
- Natural Visibility Impairment
- Uniform Rate of Progress

1. Estimating Natural Visibility Conditions 40 CFR 51.308(d)(2)(iii)

Natural background visibility, as defined in the Visibility Guidance, is estimated by calculating the expected light extinction using default estimates of natural concentrations of fine particle components adjusted by site-specific estimates of humidity. This calculation uses the IMPROVE equation, which is a formula for estimating light extinction from the estimated natural concentrations of fine particle components (or from components measured by the IMPROVE monitors). As documented in the Visibility Guidance, the EPA allows states to use "refined" or alternative approaches to the Visibility Guidance to estimate the values that characterize the natural visibility conditions of Class I areas. One alternative approach is to develop and justify the use of alternative estimates of natural concentrations of fine particle components. Another alternative is to use the "new IMPROVE equation" that was adopted for use by the IMPROVE Steering Committee in December 2005.[20] The purpose of this refinement to the "old IMPROVE equation" is to provide more accurate estimates of the various factors that affect the calculation of light extinction.

The LDEQ opted to use the new IMPROVE equation to calculate the "refined" natural visibility conditions. For Breton NWA, the LDEQ used the new IMPROVE equation to calculate the "refined" natural visibility value for the 20 percent worst days to be 11.93 deciviews and for the 20 percent best days to be 4.25 deciviews. We reviewed the LDEQ's estimates of the natural visibility conditions for Breton NWA and are proposing to find them acceptable using the new IMPROVE equation.

The new IMPROVE equation takes into account the most recent review of the science[21] and it accounts for the effect of particle size distribution on light extinction efficiency of sulfate

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[18] Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule, EPA-454/B-03-005, September 2003.

[19] As this is the first RH SIP submittal, the calculated baseline visibility condition and the current visibility condition will be the same. We expect that subsequent RH SIP submittals will reflect different calculated numbers for baseline and current visibility conditions due to the change in conditions.

[20] The IMPROVE program is a cooperative measurement effort governed by a steering committee composed of representatives from Federal agencies (including the EPA and FLMs) and RPOs. The IMPROVE monitoring program was established in 1985 to aid the creation of Federal and State implementation plans for the protection of visibility in Class I areas. One of the objectives of IMPROVE is to identify chemical species and emission sources responsible for existing anthropogenic visibility impairment. The IMPROVE program has also been a key participant in visibility-related research, including the advancement of monitoring instrumentation, analysis techniques, visibility modeling, policy formulation and source attribution field studies.

[21] The science behind the revised IMPROVE equation is discussed Chapter 5 and Appendix B of the LDEQ's TSD for the Louisiana RH SIP and in numerous published papers. See for example: Hand, J.L., and Malm, W.C., 2006, *Review of the IMPROVE Equation for Estimating Ambient Light Extinction Coefficients - Final Report.*

(SO_4), nitrate (NO_3), and organic carbon. It also adjusts the mass multiplier for organic carbon (particulate organic matter) by increasing it from 1.4 to 1.8. New terms are added to the equation to account for light extinction by sea salt and light absorption by gaseous nitrogen dioxide. Site-specific values are used for Rayleigh scattering (scattering of light due to atmospheric gases) to account for the site-specific effects of elevation and temperature. Separate relative humidity enhancement factors are used for small and large size distributions of ammonium sulfate and ammonium nitrate and for sea salt. The terms for the remaining contributors, elemental carbon (light-absorbing carbon), fine soil, and coarse mass terms, do not change between the original and new IMPROVE equations.

State Submittal: Chapter 5, and Appendices B and C

Natural background visibility, as defined in the Visibility Guidance, is based on annual average concentrations of fine particle components. Natural background visibility for the 20% worst days is estimated by assuming that fine particle concentrations for natural background are normally distributed and the 90th percentile of the annual distribution represents natural background visibility on the 20% worst days (i.e., Method 1 prediction per the Visibility Guidance).

In the Visibility Guidance, we provided default estimates for the natural visibility conditions at almost all Class I areas. For Breton, the default natural visibility value for the 20% worst days is 11.53 dv and for the 20% best days is 3.85 dv (Visibility Guidance, page 60).

The Visibility Guidance also provided that states may use a "refined approach" to estimate the values that characterize the natural visibility conditions of the Class I areas. The purpose of such a refinement would be to provide more accurate estimates with changes to the extinction algorithm that may include the concentration values, factors to calculate extinction from a measured particular species and particle size, the extinction coefficients for certain compounds, geographical variation (by altitude) of a fixed value, and the addition of visibility pollutants.

As with the calculation of baseline conditions, the LDEQ's choice of the new IMPROVE equation as the basis for its refined estimate is consistent with the EPA's Guidance, which says "the same algorithm [old or new] should be used to calculate the glide path…."[22] Because the LDEQ calculated the baseline conditions using the new IMPROVE algorithm, it is consistent that they also calculated the natural visibility conditions using the new IMPROVE algorithm. ("Guidance on the Use of Models and other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze," April, 2007). See Chapter 5 of the LA RH submittal, page 16.

2. Estimating Baseline Visibility Conditions 40 CFR 51.308(d)(2)(i)

As required by 40 CFR 51.308(d)(2)(i) of the RHR and in accordance with the Visibility

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March 2006. Prepared for Interagency Monitoring of Protected Visual Environments (IMPROVE), Colorado State University, Cooperative Institute for Research in the Atmosphere, Fort Collins, Colorado, available at *http://vista.cira.colostate.edu/improve/publications/GrayLit/016_IMPROVEeqReview/IMPROVEeqReview.htm* and Pitchford, Marc., 2006, *Natural Haze Levels II: Application of the New IMPROVE Algorithm to Natural Species Concentrations Estimates.* Final Report of the Natural Haze Levels II Committee to the RPO Monitoring/Data Analysis Workgroup. September 2006, available at *http://vista.cira.colostate.edu/improve/Publications/GrayLit/029_NaturalCondII/naturalhazelevelsIIreport.ppt.*

[22] The "glide path" is the uniform rate of progress needed to reach natural visibility conditions by 2064.

Guidance, the LDEQ calculated baseline visibility conditions for Breton NWA. The baseline condition calculation begins with the calculation of light extinction, using the IMPROVE equation. The IMPROVE equation sums the light extinction[23] resulting from individual pollutants, such as sulfates and nitrates. As with the natural visibility conditions calculation, the LDEQ chose to use the new IMPROVE equation.

The period for establishing baseline visibility conditions is 2000-2004, and baseline conditions must be calculated using available monitoring data. 40 CFR 51.308(d)(2). The Breton IMPROVE monitor did not meet the data capture requirements of the RHR for the 2000-2004 monitoring period; however data from a nearby monitoring site, the Gulfport SEARCH site, was used to supplement the Breton monitoring data. We found the use of this data to be acceptable. The Breton monitor was subsequently destroyed in 2005 by Hurricane Katrina and since replaced and relocated. The LDEQ calculated the baseline conditions at the Breton Class I area as 25.73 deciviews on the 20 percent worst days, and 13.12 deciviews on the 20 percent best days. We have reviewed the LDEQ's estimation of baseline visibility conditions at Breton and are proposing to find these estimates acceptable.

State Submittal**:** Chapter 5, Appendices B and C

Baseline conditions represent visibility for the best and worst days at the time the regional haze program is established. Baseline conditions are calculated using multiyear averaging of the 20 percent of monitored days with the highest (most impaired, or worst days) and the 20 percent of monitored days with the lowest (least impaired, or best days) light extinction values, expressed in deciviews, for the years 2000 through 2004.

The baseline is the starting point for this regional haze submittal, against which progress toward the national visibility goal is measured. As with the natural visibility conditions calculation, in calculating baseline conditions, the LDEQ chose to use the new IMPROVE equation. The choice between use of the previous or newer equation for calculating the visibility metrics for each Class I area is made by the state in which the Class I area is located. LDEQ has chosen to use the newer equation, referred to in the SIP as a "refined" approach, for calculating both the baseline and natural visibility conditions because it takes into account the most recent review of the science and because it is recommended by the IMPROVE Steering Committee.

The primary source of monitoring information for this RH SIP was the Breton IMPROVE monitor. However the Breton data was incomplete and so data from the Gulfport SEARCH monitoring site was used as well. The method used by the LDEQ for data substitution for the Breton monitor is described below; additional information is also available in the LA RH SIP Appendix C, "Proposed Data Substitution Method for Breton."

The Breton monitor started operating in late 2000, and had one incomplete quarter in each of the years 2001, 2002, and 2003. (The Breton monitor was destroyed during Hurricane Katrina on August 28, 2005, and was ultimately replaced and relocated to a site near Lake Catherine in St. Bernard Parish, Louisiana). Because the data from the Breton IMPROVE monitor did not meet the EPA's RHR data capture requirements for the five year averaging period 2000 – 2004, data from two relatively close monitoring sites, the Gulfport SEARCH site and the Sikes IMPROVE site, were considered as sources of additional monitoring data. A

[23] The amount of light lost as it travels over one million meters. The haze index, in units of deciviews (dv), is calculated directly from the total light extinction, b_{ext} expressed in inverse megameters (Mm^{-1}), as follows: $HI = 10 \ln(b_{ext}/10)$.

statistical analysis of the two proposed data sets was provided to the Visibility Improvement - States and Tribal Associations of the Southeast (VISTAS) RPO by Joe Adlhoch of Air Resource Specialists. The analysis demonstrated that the seasonal correlations of species mass comparisons were statistically more significant between Breton and Gulfport than Breton and Sikes. Gulfport was selected as the source for substitute data for the baseline period.[24] As a consequence, the Louisiana RH SIP employs a combination of visibility data from both the Breton IMPROVE and Gulfport SEARCH sites for period 2001-2004. The resulting baseline conditions represent an average for 2001-2004.

The LDEQ calculated the baseline by first summing the light extinction (where the extinction coefficient is expressed in Mm^{-1}) for sulfate, nitrate, organic carbonaceous, elemental "light-absorbing" carbonaceous, fine soil, chlorine or chloride, and coarse matter, using the following equation:

$$\beta ext = \beta ext_{S} + \beta ext_{NO3} + \beta ext_{organic} + \beta ext_{elemental} + \beta ext_{Soil} + \beta ext_{coarse} + \beta ext_{Cl} + \beta ext_{Rayleigh}$$

The LDEQ then converted the total light extinction values to deciviews, using the Haze Index (HI) equation:

$$HI\ (dv) = 10\ ln[\beta ext/(10\ Mm^{-1})]$$

The LDEQ calculated the baseline conditions at Breton as 25.73 dv on the 20% worst days, and 13.12 dv on the 20% best days.

3. Natural Visibility Impairment 40 CFR 51.308(d)(2)(iv)(A)

To address 40 CFR 51.308(d)(2)(iv)(A), the LDEQ also calculated the number of deciviews by which baseline conditions exceed natural visibility conditions for the best and worst days at Breton NWA. For the 20 percent worst days, the LDEQ calculated the number of deciviews by which baseline conditions exceed natural visibility conditions to be 13.80 dv (baseline of 25.73 dv, minus natural conditions of 11.93 dv). For the 20 percent best days at Breton, the baseline conditions exceed natural visibility conditions by 8.87 dv (baseline of 13.12 dv, minus natural conditions of 4.25 dv). We have reviewed the LDEQ's estimates of the natural visibility impairment at Breton NWA and are proposing to find these estimates acceptable.

State Submittal: Chapter 8, including Figure 8.2

Consistent with the graph displayed in Figure 8.2 of the LA RH SIP submittal, the number of deciviews by which baseline conditions exceed natural visibility conditions at Breton for the most impaired (20% worst) days is 13.80 dv (25.73 – 11.93). Similarly (but not shown in the figure), baseline conditions exceed natural visibility conditions for the least impaired (20% best) days by 8.87 dv (13.12– 4.25) at Breton. The amount of visibility impairment can be calculated by subtracting the natural visibility condition values from the baseline values.

4. Uniform Rate of Progress 40 CFR 51.308(d)(1)(i)(B)

In setting the RPGs, the LDEQ analyzed and determined the URP needed to reach

[24] The data substitution method for Breton, including results of the statistical analysis performed by VISTAS are included in Appendix C of the LA RH SIP submittal, June 13, 2008.

natural visibility conditions by the year 2064. In so doing, the LDEQ compared the baseline visibility conditions to the natural visibility conditions in Breton NWA and determined the URP needed in order to attain natural visibility conditions by 2064. The LDEQ constructed the URP consistent with the requirements of the RHR and our 2003 Tracking Progress Guidance by plotting a straight graphical line from the baseline level of visibility impairment for 2000-2004 to the level of visibility conditions representing no anthropogenic impairment in 2064 for Breton NWA.

Using a baseline visibility value of 25.73 dv and a "refined" natural visibility value of 11.93 dv for the 20 percent worst days for Breton, the LDEQ calculated the URP to be approximately 0.23 dv per year. This results in a total reduction of 13.80 dv that are necessary to reach the natural visibility condition of 11.93 dv in 2064 for Breton NWA. The URP results in a visibility improvement of 3.22 dv for Breton for the period covered by this SIP revision submittal (up to and including 2018).

Table 1. Summary of Uniform Rate of Progress

Visibility Metric	**Breton NWA**
Baseline Conditions	25.73 dv
Natural Visibility	11.93 dv
Total Improvement by 2064	13.80 dv
Improvement for this SIP by 2018	3.22 dv*
Uniform Rate of Progress	0.23 dv/yr*

We are proposing to find that the LDEQ has appropriately calculated the URP and has satisfied the requirement in 40 CFR 51.308(d)(1)(i)(B).

State Submittal: Chapter 10, including section 10-2 and Figure 10.1

In Table I above, the values with an asterisk are consistent with the glide path shown in LA RH SIP Figure 10.1.

See Sections III.B.1 – B.2 of this TSD for a discussion on the LDEQ's calculations of baseline and natural visibility conditions. As discussed above, the LDEQ calculated the URP to be 3.22 dv improvement necessary by 2018, and an overall URP of 0.23 dv/year (13.80/60), as depicted in Table 1. The LA RH SIP Figure 10.1 shows a comparison of the URP, RPG, and the anticipated improvement in visibility for the Breton Class I area. The calculations made to achieve these results: 25.73 – 11.93 = 13.80. 2064 – 2004 = 60 years. 13.80/60 = 0.23 dv per year. 2018-2004 = 14 years. Thus, 14 x 0.23 = 3.22 dv = visibility improvement by 2018.

C. Evaluation of Louisiana's Reasonable Progress Goals 40 CFR 51.308(d)(1)(ii)-(iii)

We are proposing to find that Louisiana's RPGs meet some federal requirements, but also contain some deficiencies. This section discusses three RPG requirements as they relate to the LA RH SIP: 1) establishment of the RPG; 2) reasonable progress four factor analysis; and 3) reasonable progress consultation. See the TSD for a more detailed discussion of RPG requirements and the LA RH SIP for RPGs. The establishment of RPGs and the reasonable progress four factor analysis for Louisiana are linked to the EPA's CAIR and the Transport Rule. As discussed in the Executive Summary above, in an earlier proposed action the EPA proposed a limited disapproval of the LA RH SIP (76 FR 82219). As discussed in that proposal, a number of states, including Louisiana, fully consistent with the EPA's regulations at the time, relied on the trading programs of the CAIR to satisfy the BART requirement and the requirement for a long-term strategy sufficient to achieve the state-adopted reasonable progress goals. Louisiana also relied on the CAIR in assessing the need for emissions reductions from EGUs to ensure reasonable progress. As a result, Louisiana will have to consider whether EGUs previously covered by the CAIR, whether subject to BART or not, should be controlled to ensure reasonable progress.[25]

We are proposing to find that the State's RPGs are deficient given our proposed finding, discussed in section IV.D. below, that certain of Louisiana's BART determinations are not fully approvable. In general, the State followed the requirements of 40 CFR 51.308(d)(1), but these goals do not reflect appropriate emissions reductions from BART.

Establishment of the Reasonable Progress Goals

The LDEQ adopted the CENRAP modeled 2018 visibility conditions as the RPGs for Breton NWA Class I area. The LDEQ established a RPG of 22.51 dv for Breton for 2018 for the 20% worst days. This represents a 3.22 dv improvement over a baseline of 25.73 dv.

The CENRAP's projections for 2018 for the 20% worst and best days for Breton, which Louisiana used in developing its RPGs for Breton, are shown in the LA RH SIP Appendix B titled, "Technical Support Document for CENRAP Emissions and Air Quality Modeling to Support Regional Haze State Implementation Plans."[26] *A comparison of the LDEQ's predicted rate of progress to the glide path on the 20% worst days shows that, with projected control of Louisiana sources, Louisiana will be very close to the glide path throughout the first planning period.*[27] *The CENRAP modeling shows that for the 20% best days, there would be a 0.90 dv improvement in visibility from the baseline for Breton. See, 40 CFR 51.308(d)(1).*

Table 2 shows a comparison of RPGs to URPs on most impaired days at Breton.

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[25] Because the Transport Rule will result in greater emission reductions overall than the CAIR, the EPA did not include the RPGs set by affected states in its December 30, 2011 limited disapproval (*Transport Better than BART* proposal, December 30, 2011, 76 FR 82219).

[26] The TSD for CENRAP Emissions and Air Quality Modeling to Support RH State Implementation is found in Appendix B of the Louisiana RH SIP.

[27] See the LA RH SIP submittal, Chapter 8, Section 8.5, Figure 8.2.

Table 2. Comparison of Reasonable Progress Goals to Uniform Rate of Progress on Most Impaired Days for Louisiana Class I areas

Louisiana Class I Area	Visibility Conditions on 20% Worst Days (dv)			
	Average for 20% Worst Days (Baseline 2000-2004)	2018 URP Goal	RPG	Deciview Improvement Projected by 2018 using RPG (dv)
Breton	25.73	22.51	22.72	3.01

The CENRAP's projections for 2018 for the 20% best days for Breton, which represent the LDEQ's RPGs for the 20% best days, are shown in Appendix D within LA RH SIP Appendix B: "CENRAP Emissions and Air Quality Modeling to Support RH State Implementation." The LDEQ's RPGs for the 20% best days (CENRAP projection) are shown in Table 3, which is adapted from Figure D-3b of Appendix D within LA RH SIP Appendix B.

Table 3. Comparison of Reasonable Progress Goals to Baseline Conditions on Least Impaired Days for Louisiana Class I areas

Louisiana Class I Area	Visibility Conditions on 20% Best Days (dv)		Achieved "No Degradation" (Y/N)
	Average for 20% Best Days (Baseline 2000-2004)	RPG (CENRAP Projection)	
Breton	13.12	12.22	Yes

LDEQ's Reasonable Progress "Four Factor" Analysis 40 CFR 51.308(d)(1)(i)(A)

In establishing RPGs for a Class I area, the State is required by CAA §169A(g)(1) and 40 CFR 51.308(d)(1)(i)(A) to "[c]onsider the costs of compliance, the time necessary for compliance, the energy and non-air quality environmental impacts of compliance, and the remaining useful life of any potentially affected sources, and include a demonstration showing how these factors were taken into consideration in selecting the goal." In addition to this explicit statutory requirement, the RHR also establishes an analytical requirement to ensure that each state considers carefully the suite of emission reduction measures necessary to attain the URP. The RHR provides that the EPA will consider both the state's consideration of the four factors in 40 CFR 51.308(d)(1)(i)(A) and its analysis of the URP "[i]n determining whether the State's goal for visibility improvement provides for reasonable progress." 40 CFR 51.308(d)(1)(iii). As explained in the preamble to the RHR, the URP analysis was adopted to ensure that states use a common analytical framework and to ensure an informed and equitable decision making process to ensure a transparent process that would, among other things, ensure that the public would be

provided with the information necessary to understand the emission reductions needed, the costs of such measures, and other factors associated with improvements in visibility. 64 FR at 35733.

In establishing its RPGs for 2018 for the 20% worst days, the LDEQ relied on the improvements in visibility that were anticipated to result from federal, State, and local control programs that were either currently in effect or with mandated future-year emission reduction schedules that predate 2018, including BART emission limitations projected by the LDEQ. Based on the emissions reductions from these measures, the CENRAP modeled the projected visibility conditions anticipated at each Class I area in the region in 2018, and the LDEQ used these results to establish RPGs.

States do have discretion in setting RPGs, but are required to do more than establish RPGs that meet or exceed the URP. The LDEQ did provide an analysis that considered the four statutory factors under 40 CFR 51.308(d)(1)(i)(A) to evaluate the potential of controlling certain sources or source categories for addressing visibility impacts from man-made sources within its borders.

The LDEQ provides an analysis in Appendix H, CENRAP Regional Control Strategy Analysis Plan, showing that the URP goals are reasonable. In addition, the LDEQ provided a discussion of the four factors required for this analysis: costs of compliance, time for compliance, energy and non-air quality environmental impacts of compliance, and remaining useful life of any potentially affected sources in Chapter 10 of the RH SIP.

In identifying and prioritizing potential regional haze control strategies, the LDEQ referenced the Alpine Geophysics report for the CENRAP. Table 7-4 of this report outlines potential facilities that could be considered when developing a subregional SO_2 control strategy with the associated approximate costs (see the LA RH SIP Appendix H). TSD Table 4 shows the facilities in Louisiana identified in the Alpine Report that potentially significantly impact visibility at Breton for which controls may be available. The LDEQ found that significant reductions would be achieved from consent decrees and the CAIR, and further examined the sources in Louisiana identified in the Alpine report for potential reductions. More information about the state's discussion is available in section IV.C of the TSD and in the LA RH SIP submittal.

Table 4 below shows the facilities in Louisiana identified in the Alpine Report that potentially significantly impact visibility at Breton for which controls may be available.

Table 4. Alpine Geophysics Subregional Control Strategy for Breton Island Louisiana Plants

BART source category	Facility name	Parish
Fossil fuel-fired steam electric plant	Louisiana Generating LLC, Big Cajun 2 Power Plant	Pointe Coupee
Petroleum Refinery	Marathon Ashland Petroleum LLC-LA Refining	St. John the Baptist
	ExxonMobil Refining & Supply Co., ExxonMobil Baton Rouge Refinery	East Baton Rouge
	PCS Nitrogen, Geismar Plant – Ammonia Group	Ascension
Chemical Process	Cytec Industries, Inc., Fortier Plant	Jefferson
Sulfuric Acid	Rhodia, Inc., Baton Rouge Facility	East Baton Rouge
	E.I. du Pont de Nemours & Co., Inc., Burnside Plant	Ascension

The LDEQ considered these sources in Chapter 10 of its RH SIP submittal. Additionally, the Alpine Report includes several facilities in the control strategy for Breton Island which are located in states other than Louisiana. These are listed in Table 5 below.

Table 5. Alpine Geophysics Subregional Control Strategy for Breton Island Plants in Alabama, Mississippi, and Florida

BART source category	Facility name	County and State
Fossil fuel-fired steam electric plant	Gulf Power Company Crist Electric Generating	Escambia, Florida
	Alabama Power Company – Barry	Mobile, Alabama
Petroleum refinery	Chevron Products Company, Pascagoula Ref	Jackson, Mississippi
	ExxonMobil Production Co.	Santa Rosa, Florida
Chemical process	Akzo Nobel Chemicals Inc.	Mobile, Alabama
Kraft pulp mills	International Paper Company	Dallas, Alabama

As discussed above, Louisiana will have to consider whether EGUs previously covered by the CAIR, whether subject to BART or not, should be controlled to ensure reasonable progress. Also, LDEQ must ensure it has adequately satisfied the RPG requirements to conduct a four factor analysis for sources that cause or contribute to visibility impacts at Breton.

Reasonable Progress Consultation 40 CFR 51.308(d)(1)(iv)

The LDEQ worked with the VISTAS and the CENRAP states to jointly develop the consultation strategy. The LDEQ used the CENRAP as the main vehicle for facilitating collaboration with FLMs and other states in developing its RH SIP. The LDEQ was able to use the CENRAP generated products, such as regional photochemical modeling results and visibility projections, and source apportionment modeling to assist in identifying neighboring states' contributions to the visibility impairment at Breton NWA.

The LDEQ determined that in addition to Louisiana, the following states make a contribution to decreased visibility in Louisiana's Class I area: Mississippi, Alabama, and Florida (see Table 5 above). The LDEQ conducted consultations in the form of face-to-face meetings and conference calls. Participants in the consultation process included states and tribes, the CENRAP and other RPOs, the EPA, and FLMs. The participating states determined that regional modeling and other findings based on existing and proposed controls arising from local, state, and federal requirements indicated that the Class I area in Louisiana is expected to meet the rate of progress goals for the first implementation period ending in 2018. The LDEQ determined that additional emissions reductions from other states were not necessary to address

visibility impairment at Breton for the first implementation period ending in 2018, and all states participating in its consultations agreed with this.

State Submittal**:** Chapter 10 (pages 61-62) and Appendix I

The LDEQ participated in consultations with Alabama, Florida, and Mississippi, in face-to-face meetings on January 23, 2007 in Point Clear AL, and by conference call on October 30, 2007. Louisiana also participated in discussions focused on Class I areas in Oklahoma including the Wichita Mountains Wilderness Area, and with Arkansas, Missouri, and Texas (p. 64 of the LA RH SIP).

Reasonable Progress Goal To Be Considered by Administrator: 40 CFR 51.308(d)(1)(v)

Pursuant to 40 CFR 51.308(d)(1)(v), "The reasonable progress goals established by the State are not directly enforceable but will be considered by the Administrator in evaluating the adequacy of the measures in the SIP to achieve the progress goal adopted by the State," refers to our review of RH SIPs. Because it does not require a response from the state, it is not separately evaluated here. We find that this requirement is not applicable to the LA RH SIP at this time. This provision will be reconsidered upon receipt of submittals from the LDEQ for subsequent implementation periods.

Reasonable Progress Goal Minimum: 40 CFR 51.308(d)(1)(vi)

Louisiana may not adopt a reasonable progress goal that represents less visibility improvement than is expected to result from implementation of other requirements of the CAA during the applicable planning period. We find that Louisiana meets this requirement. The RPGs established by Louisiana are based on the CENRAP 2018 modeling projections. The modeling projections conducted by the CENRAP contain projections of the visibility conditions that are anticipated to be realized at each Class I area between the 2002 base year and the 2018 future year. These projections are based on an assessment of the visibility improvements associated with local, State, and federal control programs that are either currently in effect or with mandated future-year. However, as we discuss elsewhere, these modeling projections assume SO_2 BART reductions under the CAIR. Therefore, we propose to find that Louisiana has not satisfied 40 CFR 51.308(d)(1)(vi).

State Submittal**:** Chapter 10 and Appendix I

The RPGs established by Louisiana are based on the CENRAP 2018 modeling projections. The modeling projections conducted by the CENRAP contain projections of the visibility conditions that are anticipated to be realized at each Class I area between the 2004 base year and the 2018 future year. These projections are based on an assessment of the visibility improvements associated with local, State, and federal control programs that are either currently in effect or with mandated future-year emission reduction schedules, as well as on the BART emission limitations established to date.

Reasonable Progress Goals with Rate of Improvement Slower than Needed to Attain Natural Visibility Conditions by 2064.

For the period of the SIP, if Louisiana establishes a reasonable progress goal that provides for a slower rate of improvement in visibility than the rate that would be needed to attain natural conditions by 2064, it must demonstrate, based on the factors in 40 CFR 51.308(d)(1)(i)(A), that the rate of progress for the SIP to attain natural conditions by 2064 is not reasonable; and that the progress goal adopted by it is reasonable, as indicated in 40 CFR 51.308(d)(1)(ii). We note that Louisiana's RPG is slightly slower than the URP. As we discuss above, Louisiana's RPG relies on the CAIR, and as a result, Louisiana will have to reconsider whether reductions of SO_2 from EGUs, whether subject to BART or not, are appropriate for ensuring reasonable progress and evaluate whether the reconsidered RPGs meet the rate of improvement needed to attain natural visibility conditions by 2064. Therefore we find that the LA RH SIP has not satisfied 40 CFR 51.308(d)(1)(ii).

D. Evaluation of Louisiana's BART Analyses 40 CFR 51.308(e)

BART is an element of Louisiana's LTS for the first implementation period. As discussed in more detail below and in section III.D of the proposal, the BART evaluation process consists of three components: (1) an identification of all the BART-eligible sources; (2) an assessment of whether those BART-eligible sources are subject to BART; and (3) a determination of any BART controls. The LDEQ addressed these steps as follows:

Louisiana must submit a SIP containing emission limitations representing BART and schedules for compliance with BART for each BART-eligible source that may reasonably be anticipated to cause or contribute to any impairment of visibility in any mandatory Class I Federal area, unless it demonstrates that an emissions trading program or other alternative will achieve greater reasonable progress toward natural visibility conditions.

Note: The evaluation of whether the RH SIP contains "adequate emission limitations representing BART and schedules for compliance with BART for each BART-eligible source that may reasonably be anticipated to cause or contribute to any impairment of visibility in any mandatory Class I Federal area" is conducted within each BART evaluation.

40 CFR 51.308(e)(2) – (3) addresses the use of a trading program or other alternative to BART and is applicable to this SIP, because Louisiana relies on the CAIR, to satisfy its BART requirements for NO_X and SO_2 for EGUs.

1. Identification of BART-Eligible Sources 40 CFR 51.308(e)(1)(i)

An initial step of a BART evaluation is to identify all the BART-eligible sources within the state's boundaries. The LDEQ identified the BART-eligible sources in Louisiana by utilizing the three eligibility criteria in the BART Guidelines (70 FR 39158) and our regulations (40 CFR 51.301): (1) one or more emission units at the facility fit within one of the 26 categories listed in the BART Guidelines; (2) the emission unit(s) began operation on or after August 6, 1962, and was in existence on August 6, 1977; and (3) potential emissions of any visibility-impairing pollutant from subject units are 250 tpy or more.

The LDEQ determined that the visibility-impairing pollutants in Louisiana include SO_2, NO_X, and PM, using PM less than 10 microns in diameter (PM_{10}) as an indicator for PM (LA RH SIP, Chapter 9, p. 36). This is consistent with the RHR (40 CFR 51 Appendix Y, III.A.2).

The LDEQ sent a letter and survey form, together with guidance materials, requesting information about BART eligibility to every reporter (1167 facilities) to the emissions inventory for the state requesting information about BART eligibility. Of the 1167 facilities contacted, 1165 facilities responded, and reported 76 BART-eligible facilities. Of the two non-responders, one was found to be out of business, and the other was determined to have minor emissions. See the TSD for more information. Each of the 76 BART-eligible facilities is identified in Table 6 below. We agree with the LDEQ's identification of BART-eligible sources.

State Submittal**:** Chapter 9: Best Available Retrofit Technology (BART), and Appendix F

LDEQ identified sources as BART-eligible if they:

1. Belonged to one of the twenty-six BART categories listed below;
2. Did not operate before August 7, 1962, but were in existence on August 7, 1977; and
3. Had the potential to emit 250 tpy or more of any visibility-impairing pollutant.

The LDEQ determined that ammonia and VOCs are not significant contributors to visibility impairment for the following reasons: Ammonia emissions in Louisiana are primarily due to area sources, which are not subject to BART. Ammonia emissions are addressed through the Louisiana Toxic Air Pollutant Emission Control Program LAC 33:III.Chapter 51 and controls have been implemented to lower ammonia emissions statewide. Ammonia emissions identified from BART-eligible sources are 0.21 % of the total ammonia emissions in the state. The emissions inventory prepared for the CENRAP modeling demonstrates that ammonia from point sources is not a significant visibility-impairing pollutant in Louisiana. The CENRAP modeling also demonstrated that VOCs from anthropogenic sources are not significant visibility-impairing pollutants at Breton NWA. VOC emissions are currently being addressed by the state in LAC 33:III.Chapter 21, Control of Emission of Organic Compounds. These rules were promulgated as a control measure for an ozone nonattainment area and are applicable state-wide at various levels and are considered by the state to be Reasonable Available Control Technology (cite where this was approved into the LA SIP). BART emissions of VOC are 0.04% of the total visibility impairment at Breton.

Louisiana decided to eliminate VOCs and ammonia from among the visibility-impairing pollutants for several reasons, including that "an overwhelming majority of light extinction due to SO_4 is caused by SO_2 emissions (see the LA RH SIP, Chapter 9, p. 36 for additional information). The RHR directs states to exercise judgment in deciding whether VOCs and NH_3 impair visibility in their 22 Class I area(s). 70 FR 39104, at 39160. As discussed above in section V.C.3, the CENRAP performed modeling sensitivity analyses and/or other analyses, which demonstrated that anthropogenic emissions of VOC and NH_3 do not significantly impair visibility in the CENRAP region. Therefore, Louisiana did not consider ammonia or VOCs among visibility-impairing pollutants and did not further evaluate NH3 and VOC emissions sources for potential controls under BART or reasonable progress.

On November 4, 2002, LDEQ sent a letter and survey form, together with guidance materials, to every reporter (1167 facilities) to the emissions inventory for the state requesting information about BART eligibility by December 6, 2002. This survey is included in Appendix F of the LA RH SIP. Appendix E of the Louisiana RH submittal provides the survey results, as well as a detailed description of each BART-eligible emission unit.

Each of the 76 identified facilities fell in one or more of the 26 BART categories:

1. Fossil-fuel fired steam electric plants of more than 250 million British thermal units (BTU) per hour heat input,
2. Coal cleaning plants (thermal dryers),
3. Kraft pulp mills,
4. Portland cement plants,
5. Primary zinc smelters,
6. Iron and steel mill plants,
7. Primary aluminum ore reduction plants,
8. Primary copper smelters,
9. Municipal incinerators capable of charging more than 250 tons of refuse per day,
10. Hydrofluoric, sulfuric, and nitric acid plants,
11. Petroleum refineries,
12. Lime plants,
13. Phosphate rock processing plants,
14. Coke oven batteries,
15. Sulfur recovery plants,
16. Carbon black plants (furnace process),
17. Primary lead smelters,
18. Fuel conversion plants,
19. Sintering plants,
20. Secondary metal production facilities,
21. Chemical process plants,
22. Fossil-fuel boilers of more than 250 million BTUs per hour heat input,
23. Petroleum storage and transfer facilities with a capacity exceeding 300,000 barrels,
24. Taconite ore processing facilities,
25. Glass fiber processing plants, and
26. Charcoal production facilities.

Also, these identified units had potential emissions of 250 tpy or more for one or more visibility-impairing pollutant, were in existence on August 7, 1977 and began operation after August 7, 1962. These emissions units comprise the "BART-eligible sources" listed in Table 6, as adapted from Appendix E of the Louisiana RH SIP:

Table 6. Facilities with BART-eligible units in Louisiana (76)[28]

BART source category	Facility name	Parish	Unit Description
Fossil fuel-fired steam electric plants	Cleco Power LLC., Rodemacher Power Station	Rapides	Unit 1 boiler

[28] The LDEQ RH SIP submittal has "77" in its Table title; however, only 76 sources are listed.

of more than 250 MMBTU/hr heat input	Entergy Louisiana, Sterlington	Ouachita	Unit 7 boiler
	City of Ruston, Ruston Electrical Generation Station	Lincoln	Boilers 1, 2, and 3
	City of Natchitoches Utility Dept.	Natchitoches	3 boilers
	Louisiana Generating LLC, Big Cajun 2 Power Plant	Pointe Coupee	Units 1, 2, and 3
	Entergy New Orleans, Michoud	Orleans	Units 2 and 3
	Entergy Louisiana, Waterford	St. Charles	Units 1 and 2
	Entergy Gulf States, Willow Glen	Iberville	Units 2, 3, 4, and 5 boilers
	Louisiana Energy & Power Authority, Morgan City Steam Plant	St. Mary, St. Martin	Units 1, 2, 3, and 4 boilers
	Entergy Louisiana, Ninemile Point	Jefferson	Units 4 and 5 boilers
	Entergy Gulf States, Nelson	Calcasieu	# 4 boiler
Fossil fuel-fired steam electric plants of more than 250 MMBTU/hr heat input (continued)	Cleco Power LLC., Teche Power Station	St. Mary	Unit 3 boiler
	Louisiana Energy and Power Authority, Plaquemine Steam Plant	Iberville	Boilers 1 and 2
	Entergy Louisiana, Little Gypsy	St. Charles	Units 2 and 3
	Louisiana Generating LLC, Big Cajun 1 Power Plant	Pointe Coupee	Units 1 and 2

	Lafayette Utilities System, Louis "Doc" Bonin Electric Generation Station	Lafayette	Units 1, 2 and 3
	Terrebonne Parish Consolidated Government, Houma Generating Station	Terrebonne	Units 15 and 16 boilers
	Monochem, Inc., Geismar Facility	Ascension	#1, 2, and 3 boiler stacks
Secondary metal production	Exide Technologies, Baton Rouge Smelter	East Baton Rouge	Various emission points in facility
Kraft pulp mills	Graphics Packaging International, West Monroe Mill	Ouachita	Various emission points in facility
	Smurfit-Stone Container Enterprise, Inc.	Jackson	Various emission points in facility
	International Paper Company, Bastrop - Louisiana Mill	Morehouse	Various emission points in facility
	International Paper, Pineville Mill	Rapides	Various emission points in facility
Kraft pulp mills (continued)	Boise Cascade, DeRidder Paper Mill	Beauregard	Recovery furnace, bark boiler #1, and lime kiln
	Weyerhaeuser Company, Red River Mill	Natchitoches	Various emission points in facility
	Temple Inland, Bogalusa Mill	Washington	Lime kiln, #12 hogged fuel boiler
	Georgia Pacific, Port Hudson Operations	East Baton Rouge	Various emission points in facility

	Tembec USA LLC, St. Francisville Mill	West Feliciana	Various emission points in facility
Petroleum Refinery	ConocoPhillips Co., Alliance Refinery	Plaquemines	Various emission points in facility
	Marathon Petroleum Company, LLC-LA Refining Division, Garyville Refinery	St. John the Baptist	Various emission points and storage vessels in facility
	Murphy Oil USA, Inc., Meraux Refinery	St. Bernard	Various emission points in facility
	Valero Refining-New Orleans, LLC, St. Charles Refinery	St. Charles	Hydrotreater heater, FCC unit, flare #1, and sulfur recovery unit
	ExxonMobil Refining & Supply Co., ExxonMobil Baton Rouge Refinery	East Baton Rouge	Various emission points in facility
	Chalmette Refining, L.L.C., Chalmette Refinery	Orleans	Various emission points and storage vessels in facility
Petroleum Refinery (continued)	Placid Refining Company, L.L.C., Port Allen Refinery	West Baton Rouge	Various emission points and storage vessels in facility
	Motiva Enterprises LLC, Norco Refinery	St. Charles	Various emission points in facility
	CITGO Petroleum, Lake Charles Manufacturing Complex	Calcasieu	Various emission points in facility
	Motiva Enterprises, LLC, Convent Refinery	St. James	Various emission points in facility
	CITGO Petroleum Corporation, Clifton Ridge Terminal	Calcasieu	Various storage vessels

	CITGO Petroleum Corporation, Pecan Grove Tank	Calcasieu	Various storage vessels and fugitives
Petroleum Storage	Koch Pipeline Company, L.P., St. James Terminal	St. James	Various emission points and storage vessels in facility
Sulfur recovery plants	Chemtrade Refinery Services Inc., Sulfuric Acid Plant	Caddo	SO_2 Scrubber Tail Gas Vent
Carbon black	Degussa Engineered Carbons, LP, Ivanhoe Carbon Black Plant	St. Mary	Various emission points in facility
	Sid Richardson Carbon Company, Addis Plant	Iberville	Units 1,2, and 3 flares and dryers 2,3, and 4
	Cabot Corporation, Cabot Ville Platte Plant	Evangeline	Various emission points in facility
Carbon black (continued)	Cabot Corporation, Canal Plant	St. Mary	Various emission points in Facility
	Columbian Chemicals Company, North Bend	St. Mary	Various emission points in facility
Chemical process plants	Koch Nitrogen Company, Sterlington Ammonia Plant	Ouachita	Various emission points in Facility
	Procter & Gamble Manufacturing Company, Alexandria Plant	Rapides	#2 process heater
	PCS Nitrogen, Geismar Plant – Ammonia Group	Iberville	Various emission points in sulfuric acid, phosphoric acid, ammonia, nitric acid, and ammonium nitrate plants and other emission points in facility

	Mosaic Fertilizer LLC, Uncle Sam Plant	St. James	Various emission points in Facility
	DuPont, Pontchartrain Diamines Unit	St. John the Baptist	Various emission points in Facility
	ExxonMobil, Baton Rouge Chemical Plant	East Baton Rouge	Various emission points in Facility
	CF Industries, Donaldsonville	Ascension	Various emission points in the # 1, 2, 3, 4 ammonia plants, # 1 and 2 urea plants, #1 nitric acid plant and other emission points in facility
	Shell Chemical LP, Norco Chemical Plant - East Site	St. Charles	Various emission points in Facility
Chemical Process (continued)	Gramercy Alumina	St. John the Baptist	Various emission points in Facility
	Union Carbide Corp., Taft/Star Manufacturing Complex	St. Charles	Various emission points and storage vessels in facility
	Mosaic Fertilizer LLC, Faustina Plant	Ascension	Various emission points in Facility
	Chevron Oronite Company LLC, Oak Point Plant	Plaquemines	Incinerator
	BASF Corporation, Geismar Site	Ascension	Boiler #6
	Shell Chemical LP, Geismar Plant	Ascension	Various emission points in Facility
	TOTAL Petrochemicals USA, Inc., Cos-Mar Styrene Monomer Plant	Iberville	Various emission points and storage vessels in facility

	Lyondell Chemical Company, Lake Charles Plant	Calcasieu	Various emission points in nitric acid plant and in facility
	Williams Olefins LLC, Geismar Ethylene Plant	Iberville	Olefin cracking heaters
	Chemtura USA Corporation, Geismar Plant	Ascension	Various emission points in Facility
	Sasol North America Inc., Lake Charles Chemical Plant	Calcasieu	Various emission points in Facility
	DuPont Performance Elastomers, Pontchartrain Chloroprene Unit	St. John the Baptist	Various emission points and storage vessels in facility
Chemical Process (continued)	The Dow Chemical Company, Louisiana Operations	Iberville	Various emission points in Facility
	PPG Industries, Inc., Derivatives	Calcasieu	Various emission points in Facility
	Equistar Chemicals, Lake Charles Plant	Calcasieu	Various emission points in facility
	Syngenta Crop Protection, St. Gabriel Plant - HCN Unit	Iberville	Various emission points in facility
	Firestone Polymers LLC, Lake Charles Facility	Calcasieu	Various emission points in facility
	Chevron Phillips Chemical Company, LP, St. James Styrene Facility	Ascension	ABC Boilers
	Lion Copolymer, LLC, Baton Rouge Plant	East Baton Rouge	Various emission points in facility

Sulfuric Acid	Rhodia, Inc., Baton Rouge Facility	East Baton Rouge	Sulfuric acid Units 1 and 2
	E.I. du Pont de Nemours & Co., Inc., Burnside Plant	Ascension	Sulfuric acid plant and other emission points in facility

2. Identification of Sources Subject to BART

The next step of the BART evaluation is to identify those BART-eligible sources that may reasonably be anticipated to cause or contribute to any visibility impairment at any Class I area, i.e. those sources that are subject to BART. The BART Guidelines allow states to consider exempting some BART-eligible sources from further BART review because they may not reasonably be anticipated to cause or contribute to any visibility impairment in a Class I area. Following the identification of those sources that were determined to be BART eligible, the LDEQ performed a combination approach to determine whether BART-eligible sources would cause or contribute to visibility impairment at Breton. The LDEQ used a combination of an individual source attribution approach (dispersion modeling), and, for sources with common characteristics, a model plant approach.[29] *Please see the TSD and Appendix A of the TSD for more details regarding how sources were exempted from BART by the LDEQ and our analysis of this modeling.*

Louisiana considered each of the 76 BART-eligible facilities described earlier using the modeling methodologies described below.

State Submittal**:** Chapter 9 BART and Appendix E

LDEQ provided screening modeling results in Chapter 9 and Appendix E of the LA RH SIP for all sources identified in the LA RH SIP as BART-eligible sources. Louisiana considered each of the 76 BART-eligible facilities described earlier. Modeling using the methodologies described in the sections below, titled "Modeling Methodology" and "Contribution Threshold" was considered.

Modeling Methodology

The BART Guidelines direct states to address SO_2, NO_X and PM emissions as visibility-impairing pollutants, and states must exercise their "best judgment to determine whether ammonia or VOC emissions from a source are likely to have an impact on visibility in an area." See, 70 FR 39162. As noted above, the LDEQ determined that the visibility-impairing pollutants in Louisiana are SO_2, NO_X, and particulate matter. Louisiana decided to not consider VOCs and ammonia among visibility-impairing pollutants for several reasons, as discussed below. We propose to accept the State's decision to address only SO_2, NO_X, and PM as the visibility impairing pollutants.

Consistent with BART Guidelines, the LDEQ used the CALPUFF modeling system to

[29] The "model plant" approach can be used to determine whether a category of sources that share specific characteristics should be exempted from BART because these sources are not anticipated to cause or contribute to visibility impairment at a Class I area. *See* 40 CFR 51 Appendix Y.III.

determine whether individual sources identified as BART-eligible were subject to or exempt from BART. For this modeling, Louisiana considered 76 BART-eligible facilities, as discussed in section IV.D.1. Based on this analysis, Louisiana identified 27 facilities for further consideration due to visibility impact above a 0.5 dv contribution threshold. These facilities are discussed in the next section of this action and are identified in Table 7 below. We are proposing to find the LDEQ's chosen modeling methodology and screening approach are acceptable.

For states using modeling to determine the applicability of BART to single sources, the BART Guidelines note that an important step is to set a contribution threshold to assess whether the impact of a single source is sufficient to cause or contribute to visibility impairment at a Class I area. The BART Guidelines state that, "[a] single source that is responsible for a 1.0 deciview change or more should be considered to 'cause' visibility impairment." 70 FR 39104, 39161. The BART Guidelines also state that "the appropriate threshold for determining whether a source contributes to visibility impairment "may reasonably differ across states," but "[a]s a general matter, any threshold that you use for determining whether a source 'contributes' to visibility impairment should not be higher than 0.5 deciviews." Id. Further, in setting a contribution threshold, states should "consider the number of emissions sources affecting the Class I areas at issue and the magnitude of the individual sources' impacts." The Guidelines affirm that states are free to use a lower threshold if they conclude that the location of a large number of BART-eligible sources in proximity of a Class I area justifies this approach. Considering the number of sources affecting Louisiana's Class I area and the magnitude of each source's impact, the LDEQ used a contribution threshold of 0.5 dv for determining which sources are subject to BART. We propose to accept the State's selection of 0.5 dv as the threshold value.

For the 27 facilities referenced above, Louisiana requested that the facilities provide additional modeling: Screening Modeling and, for sources that failed the Screening Modeling, Refined Modeling. Those facilities that the LDEQ requested to conduct this additional modeling and the results of the individual Screening and Refined Modeling analyses for each of these sources are shown in Table 7 below.[30] Our evaluation of these modeling results showed that there was one facility, Mosaic Fertilizer Uncle Sam Plant (Mosaic), which had modeled visibility impacts that exceeded the 0.5 dv contribution threshold, but which the LDEQ determined was not subject to BART. At the time of the submittal, the LDEQ's modeling showed that, using then-current permit maximum hourly emission rates, Mosaic had an operating emissions rate of 2,250 lbs/hr (maximum) and a significant modeled visibility impact at Breton of over 0.5 dv. At that time, Mosaic was reviewing possibilities for future control strategies on the A-Train Sulfuric Acid Stack that could be expected to reduce SO_2 emissions for the facility. For purposes of performing a refined modeling analysis and exempting the source from BART requirements, Mosaic considered potential future emission rates based on future controls, and used a modeling data input of 258.3 lbs/hr (maximum). Although future controls were being considered, they were not yet in place. The RHR states that a source can be exempted if its visibility impacts at the time the SIP is developed are less than the screening value. See, 70 FR 39118. Because Mosaic's impacts were greater than the screening value, at that time, the LDEQ should have completed a full five factor analysis to assure the appropriate BART level of control was implemented (as discussed in section IV.D.3). Therefore, we propose to find that the LDEQ erred in exempting the Mosaic facility from BART. For those facilities for which Screening and Refined Modeling was

[30] *The LDEQ provided screening modeling results for all sources identified as BART-eligible; see Appendix E of the LA RH SIP submission.*

provided, with the exception of Mosaic, we propose to approve the modeling in the LA RH SIP submittal that identifies which sources are exempt from BART.

The LDEQ's BART Modeling Protocol is found in Chapter 9 and Appendix E of the LA RH submittal. The LDEQ utilized BART modeling to determine what sources contribute to visibility impairment in Louisiana's Class I area-- Breton, as well as nearby Class I areas in other states, with sources having a visibility impact below 0.5 deciviews being exempt from BART. In accordance with the BART Guidelines, Louisiana employed both a model plant approach and dispersion modeling to further exempt sources from being subject to BART.

The BART Guidelines[31] explain that "analyses of model plants could be used to exempt certain BART-eligible sources that share specific characteristics." The BART Guidelines further explain how these types of analyses should be conducted:

> In carrying out this approach, you could use modeling analyses of representative plants to reflect groupings of specific sources with important common characteristics. Based on these analyses, you may find that certain types of sources are clearly anticipated to cause or contribute to visibility impairment. You could then choose to categorically require those types of sources to undergo a BART determination. Conversely, you may find based on representative plant analyses that certain types of sources are not reasonably anticipated to cause or contribute to visibility impairment. To do this, you may conduct your own modeling to establish emission levels and distances from Class I areas on which you can rely to exempt sources with those characteristics. For example, based on your modeling you might choose to exempt all NO_X-only sources that emit less than a certain amount per year and are located a certain distance from a Class I area. You could then choose to categorically exempt such sources from the BART determination process.

Louisiana adopted this approach and proceeded in its model plant analysis by selecting specific facilities as "models," exempting those facilities from being subject to BART though dispersion modeling, and then using the results of those analyses, to exclude additional sources. Louisiana created an artificial model source to examine impacts to Class I areas to the north and west—Upper Buffalo, Hercules Glades, or Wichita Mountains Class I areas. This source resulted in visibility impacts to these Class I areas of less than Louisiana's threshold of 0.5 dv. Louisiana reasoned that due to the model plant's location, in northwest Louisiana, all Louisiana BART facilities to the south and the east of the model plant with fewer NO_X, SO_2, and PM emissions (and certain other modeling parameters) would also not have an impact of 0.5 deciviews or more to Upper Buffalo, Hercules Glades, or Wichita Mountains. Louisiana then examined the Class I areas to the east and noted that the Sipsey and Mammoth Cave Class I areas are more than 300 kms from any Louisiana BART source. Louisiana used residence time and area of influence plots for Sipsey and Mammoth Cave for 2002-2004 supplied by the VISTAS RPO. Louisiana concluded these plots shown indicate that visibility impacts from its sources on these Class I areas were minimal and both should be removed from consideration. Louisiana concluded the Class I areas of concern for Louisiana BART-eligible facilities were Caney Creek in Arkansas and Breton Island in Louisiana.

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[31] 70 FR 39162

Louisiana noted the two facilities with the highest emission divided by distance ratios with respect to the Caney Creek Class I area were Smurfit Stone in Jackson Parish, Louisiana and Chemtrade Refining in Caddo Parish, Louisiana. Louisiana conducted CALPUFF screening and concluded that either facility had impacts less than 0.5 dv. Another facility, Graphics Packaging, was requested to conduct its own BART screening analysis and was similarly exempted. Based on the results of its model plant analysis and the Graphics Packaging analyses, Louisiana concluded none of its sources resulted in visibility impacts at Caney Creek above the selected BART threshold of 0.5 dv.

Louisiana took a different approach for assessing the BART visibility impacts at Breton Island. Louisiana modeled two facilities, the ConocoPhillips Alliance Refiner in St. Bernard Parish, Louisiana and the Big Cajun 2 power plant in Pointe Coupee Parish, Louisiana. [32] Louisiana noted that both the ConocoPhillips and Big Cajun sources each resulted in visibility impacts greater than the selected BART threshold of 0.5 dv. Louisiana requested that any facility with an emissions-to-distance ratio greater than that from Big Cajun 2 should conduct its own BART screening modeling. Louisiana then preformed BART screening modeling on a number of other sources for visibility impacts on Breton Island and removed all other sources with lower emissions-to-distance ratios.

Based on this analysis, Louisiana identified 27 facilities for further consideration of visibility impact above a contribution threshold, and requested that these facilities either screen or perform refined modeling. These facilities are identified with bolded text in Table 7 below, and are also discussed further in the next section of this TSD. The facilities in Table 7 which are not highlighted were determined by LDEQ's analysis to be not subject to BART.

Table 7. BART-eligible Facilities Identified by LDEQ as
a) Requested to Screen or Perform Refined Modeling, or
b) Not Subject to BART

BART source category	**Facility name**	**Parish**	**Unit Description**
Fossil fuel-fired steam electric plants of more than 250 MMBTU/hr heat input	Cleco Power LLC., Rodemacher Power Station	Rapides	Unit 1 boiler
	Entergy Louisiana, Sterlington	Ouachita	Unit 7 boiler
	City of Ruston, Ruston Electrical Generation Station	Lincoln	Boilers 1, 2, and 3
	City of Natchitoches Utility Dept.	Natchitoches	3 boilers

[32] We note that Louisiana only included PM impacts from Big Cajun 2, relying on SO_2 and NO_X exemptions due to the CAIR. As we note elsewhere, because the CAIR has been remanded, we cannot approve Louisiana's reliance on the CAIR to satisfy BART.

	Louisiana Generating LLC, Big Cajun 2 Power Plant	Pointe Coupee	**Units 1, 2, and 3**
	Entergy New Orleans, Michoud	Orleans	**Units 2 and 3**
	Entergy Louisiana, Waterford	St. Charles	Units 1 and 2
	Entergy Gulf States, Willow Glen	Iberville	**Units 2, 3, 4, and 5 boilers**
	Louisiana Energy & Power Authority, Morgan City Steam Plant	St. Mary, St. Martin	Units 1, 2, 3, and 4 boilers
	Entergy Louisiana, Ninemile Point	Jefferson	Units 4 and 5 boilers
	Entergy Gulf States, Nelson	Calcasieu	# 4 boiler
Fossil fuel-fired steam electric plants of more than 250 MMBTU/hr heat input (continued)	Cleco Power LLC., Teche Power Station	St. Mary	Unit 3 boiler
	Louisiana Energy and Power Authority, Plaquemine Steam Plant	Iberville	Boilers 1 and 2
	Entergy Louisiana, Little Gypsy	St. Charles	Units 2 and 3
	Louisiana Generating LLC, Big Cajun 1 Power Plant	Pointe Coupee	Units 1 and 2
	Lafayette Utilities System, Louis "Doc" Bonin Electric Generation Station	Lafayette	Units 1, 2 and 3
	Terrebonne Parish Consolidated Government, Houma Generating Station	Terrebonne	Units 15 and 16 boilers

	Monochem, Inc., Geismar Facility	Ascension	#1, 2, and 3 boiler stacks
Secondary metal production	**Exide Technologies, Baton Rouge Smelter**	East Baton Rouge	**Various emission points in facility**
Kraft pulp mills	**Graphics Packaging International, West Monroe Mill**	Ouachita	**Various emission points in facility**
	Smurfit-Stone Container Enterprise, Inc.	Jackson	Various emission points in facility
	International Paper Company, Bastrop - Louisiana Mill	Morehouse	Various emission points in facility
	International Paper, Pineville Mill	Rapides	Various emission points in facility
Kraft pulp mills (continued)	Boise Cascade, DeRidder Paper Mill	Beauregard	Recovery furnace, bark boiler #1, and lime kiln
	Weyerhaeuser Company, Red River Mill	Natchitoches	Various emission points in facility
	Temple Inland, Bogalusa Mill	Washington	**Lime kiln, #12 hogged fuel boiler**
	Georgia Pacific, Port Hudson Operations	East Baton Rouge	**Various emission points in facility**
	Tembec USA LLC, St. Francisville Mill	West Feliciana	Various emission points in facility
Petroleum Refinery	**ConocoPhillips Co., Alliance Refinery**	Plaquemines	**Various emission points in facility**

	Marathon Petroleum Company, LLC-LA Refining Division, Garyville Refinery	St. John the Baptist	**Various emission points and storage vessels in facility**
	Murphy Oil USA, Inc., Meraux Refinery	St. Bernard	**Various emission points in facility**
	Valero Refining-New Orleans, LLC, St. Charles Refinery	St. Charles	**Hydrotreater heater, FCC unit, flare #1, and sulfur recovery unit**
	ExxonMobil Refining & Supply Co., ExxonMobil Baton Rouge Refinery	East Baton Rouge	**Various emission points in facility**
	Chalmette Refining, L.L.C., Chalmette Refinery	Orleans	**Various emission points and storage vessels in facility**
Petroleum Refinery (continued)	**Placid Refining Company, L.L.C., Port Allen Refinery**	West Baton Rouge	**Various emission points and storage vessels in facility**
	Motiva Enterprises LLC, Norco Refinery	St. Charles	**Various emission points in facility**
	CITGO Petroleum, Lake Charles Manufacturing Complex	Calcasieu	Various emission points in facility
	Motiva Enterprises, LLC, Convent Refinery	St. James	Various emission points in facility
	CITGO Petroleum Corporation, Clifton Ridge Terminal	Calcasieu	Various storage vessels
	CITGO Petroleum Corporation, Pecan Grove Tank	Calcasieu	Various storage vessels and fugitives

Petroleum Storage	Koch Pipeline Company, L.P., St. James Terminal	St. James	Various emission points and storage vessels in facility
Sulfur recovery plants	Chemtrade Refinery Services Inc., Sulfuric Acid Plant	Caddo	SO_2 Scrubber Tail Gas Vent
Carbon black	**Degussa Engineered Carbons, LP, Ivanhoe Carbon Black Plant**	St. Mary	**Various emission points in facility**
	Sid Richardson Carbon Company, Addis Plant	Iberville	**Units 1,2, and 3 flares and dryers 2,3, and 4**
	Cabot Corporation, Cabot Ville Platte Plant	Evangeline	Various emission points in facility
Carbon black (continued)	Cabot Corporation, Canal Plant	St. Mary	Various emission points in Facility
	Columbian Chemicals Company, North Bend	St. Mary	Various emission points in facility
Chemical process plants	Koch Nitrogen Company, Sterlington Ammonia Plant	Ouachita	Various emission points in Facility
	Procter & Gamble Manufacturing Company, Alexandria Plant	Rapides	#2 process heater
	PCS Nitrogen, Geismar Plant – Ammonia Group	Iberville	**Various emission points in sulfuric acid, phosphoric acid, ammonia, nitric acid, and ammonium nitrate plants and other emission points in facility**
	Mosaic Fertilizer LLC, Uncle Sam Plant	St. James	**Various emission points in Facility**

	DuPont, Pontchartrain Diamines Unit	St. John the Baptist	Various emission points in Facility
	ExxonMobil, Baton Rouge Chemical Plant	East Baton Rouge	**Various emission points in Facility**
	CF Industries, Donaldsonville	Ascension	**Various emission points in the # 1, 2, 3, 4 ammonia plants, # 1 and 2 urea plants, #1 nitric acid plant and other emission points in facility**
	Shell Chemical LP, Norco Chemical Plant - East Site	St. Charles	**Various emission points in Facility**
Chemical Process (continued)	**Gramercy Alumina**	St. John the Baptist	**Various emission points in Facility**
	Union Carbide Corp., Taft/Star Manufacturing Complex	St. Charles	**Various emission points and storage vessels in facility**
	Mosaic Fertilizer LLC, Faustina Plant	Ascension	**Various emission points in Facility**
	Chevron Oronite Company LLC, Oak Point Plant	Plaquemines	Incinerator
	BASF Corporation, Geismar Site	Ascension	Boiler #6
	Shell Chemical LP, Geismar Plant	Ascension	Various emission points in Facility
	TOTAL Petrochemicals USA, Inc., Cos-Mar Styrene Monomer Plant	Iberville	Various emission points and storage vessels in facility

	Lyondell Chemical Company, Lake Charles Plant	Calcasieu	Various emission points in nitric acid plant and in facility
	Williams Olefins LLC, Geismar Ethylene Plant	Iberville	Olefin cracking heaters
	Chemtura USA Corporation, Geismar Plant	Ascension	Various emission points in Facility
	Sasol North America Inc., Lake Charles Chemical Plant	Calcasieu	Various emission points in Facility
	DuPont Performance Elastomers, Pontchartrain Chloroprene Unit	St. John the Baptist	Various emission points and storage vessels in facility
Chemical Process (continued)	The Dow Chemical Company, Louisiana Operations	Iberville	Various emission points in Facility
	PPG Industries, Inc., Derivatives	Calcasieu	Various emission points in Facility
	Equistar Chemicals, Lake Charles Plant	Calcasieu	Various emission points in facility
	Syngenta Crop Protection, St. Gabriel Plant - HCN Unit	Iberville	Various emission points in facility
	Firestone Polymers LLC, Lake Charles Facility	Calcasieu	Various emission points in facility
	Chevron Phillips Chemical Company, LP, St. James Styrene Facility	Ascension	ABC Boilers
	Lion Copolymer, LLC, Baton Rouge Plant	East Baton Rouge	Various emission points in facility

Sulfuric Acid	**Rhodia, Inc., Baton Rouge Facility**	East Baton Rouge	**Sulfuric acid Units 1 and 2**
	E.I. du Pont de Nemours & Co., Inc., Burnside Plant	Ascension	**Sulfuric acid plant and other emission points in facility**

As discussed in section III.F.1 of this TSD, the original meteorological databases generated by the CENRAP did not include observations as the EPA guidance recommends. Therefore, in their evaluation to determine if a source exceeds the 0.5 dv contribution threshold at nearby Class I areas, states used the 1st high values (i.e., maximum value) of modeled visibility impacts instead of the 8th high values (i.e., 98th percentile value). The use of the 1st high modeled values was agreed to by EPA, representatives of the FLMs, and the CENRAP stakeholders.

For the 27 facilities referenced in Table 7 above, Louisiana requested that the facilities either use screening modeling or perform refined modeling. The results of the individual screening and refined modeling analyses for each of these sources are shown in Table 8 below.[33]

Table 8. BART-eligible Facilities Identified by LDEQ as Requested to Screen or Perform Refined Modeling: CALPUFF/CALPOST Screening Results

BART source category	Facility name	Modeling Results	Unit Description
	Louisiana Generating LLC, Big Cajun 2 Power Plant	Passed Refined Model	Units 1, 2, and 3
	Entergy New Orleans, Michoud	Passed Refined Model	Units 2 and 3
	Entergy Gulf States, Willow Glen	Passed Refined Model	Units 2, 3, 4, and 5 boilers
Secondary metal production	Exide Technologies, Baton Rouge Smelter	Passed Screening Model	Various emission points in facility
Kraft pulp mills	Graphics Packaging International, West Monroe Mill	Passed Screening Model	Various emission points in facility

[33] The LDEQ provided screening modeling results for all sources identified as BART-eligible; see Appendix E of the LA RH SIP submission.

	Temple Inland, Bogalusa Mill	Passed Screening Model	Lime kiln, #12 hogged fuel boiler
	Georgia Pacific, Port Hudson Operations	Passed Screening Model	Various emission points in facility
Petroleum Refinery	ConocoPhillips Co., Alliance Refinery	Failed Refined Model	Various emission points in facility
	Marathon Petroleum Company, LLC-LA Refining Division, Garyville Refinery	Passed Screening Model	Various emission points and storage vessels in facility
	Murphy Oil USA, Inc., Meraux Refinery	Passed Refined Model	Various emission points in facility
	Valero Refining-New Orleans, LLC, St. Charles Refinery	Passed Screening Model	Hydrotreater heater, FCC unit, flare #1, and sulfur recovery unit
	ExxonMobil Refining & Supply Co., ExxonMobil Baton Rouge Refinery	Passed Screening Model	Various emission points in facility
	Chalmette Refining, L.L.C., Chalmette Refinery	Passed Screening Model	Various emission points and storage vessels in facility
Petroleum Refinery (continued)	Placid Refining Company, L.L.C., Port Allen Refinery	Passed Screening Model	Various emission points and storage vessels in facility
	Motiva Enterprises LLC, Norco Refinery	Passed Refined Model	Various emission points in facility
Carbon black	Degussa Engineered Carbons, LP, Ivanhoe Carbon Black Plant	Passed Refined Model	Various emission points in facility
	Sid Richardson Carbon Company, Addis Plant	Failed Refined Model	Units 1,2, and 3 flares and dryers 2,3, and 4

	PCS Nitrogen, Geismar Plant – Ammonia Group	Passed Refined Model	Various emission points in sulfuric acid, phosphoric acid, ammonia, nitric acid, and ammonium nitrate plants and other emission points in facility
	Mosaic Fertilizer LLC, Uncle Sam Plant	Passed Refined Model	Various emission points in Facility
	ExxonMobil, Baton Rouge Chemical Plant	Passed Screening Model	Various emission points in Facility
	CF Industries, Donaldsonville	Passed Screening Model	Various emission points in the # 1, 2, 3, 4 ammonia plants, # 1 and 2 urea plants, #1 nitric acid plant and other emission points in facility
	Shell Chemical LP, Norco Chemical Plant - East Site	Passed Refined Model	Various emission points in Facility
Chemical Process (continued)	Gramercy Alumina	Passed Screening Model	Various emission points in Facility
	Union Carbide Corp., Taft/Star Manufacturing Complex	Passed Screening Model	Various emission points and storage vessels in facility
	Mosaic Fertilizer LLC, Faustina Plant	Passed Screening Model	Various emission points in Facility
Sulfuric Acid	Rhodia, Inc., Baton Rouge Facility	Failed Refined Model	Sulfuric acid Units 1 and 2
	E.I. du Pont de Nemours & Co., Inc., Burnside Plant	Passed Screening Model	Sulfuric acid plant and other emission points in facility

Sources Subject to BART

The sources that were not exempt from the BART requirements via dispersion modeling

analyses and/or the use of model plants are subject to BART. For sources subject to BART in Louisiana, the LDEQ must make a determination of BART. The LDEQ identified three sources as subject to BART and we identified one more, Mosaic, as discussed previously. All four of these sources are shown in Table 9.

Table 9. Non-EGU Sources in Louisiana Subject to BART

Facility Name	BART Emission Units	Source Category	Pollutants Evaluated	Visibility Contribution at Breton (dv)
ConocoPhillips Co. Alliance Refinery	Various emission points in facility	Petroleum Refinery	SO_2	2. 69
			NO_X	
			PM_{10}	
Rhodia, Inc.	Sulfuric Acid Units 1 and 2	Sulfuric Acid	SO_2	1.04 / 0.16*
Sid Richardson Carbon Company	Units 1,2, and 3 flares and dryers 2,3 and 4	Carbon Black	SO_2	0.57
Mosaic Fertilizer Uncle Sam Plant**	Various emission points in facility*	Chemical Process Facility*	None*	**

* Visibility contribution prior to CD controls / following implementation of CD controls.
**This facility was identified by EPA as subject to BART.

Louisiana did not submit source-specific BART evaluations for EGUs in its analysis because the state chose to meet BART requirements for EGUs for SO_2 and NO_X by participation in the CAIR, and because modeling results showed that the PM emissions from EGUs did not warrant further control. This is discussed further in the next section.

As discussed in section I of this TSD, CAIR has been remanded, and therefore, LDEQ must re-evaluate the visibility impacts from BART-eligible EGUs based on comprehensive modeling data.

3. BART Determinations 40 CFR 51.308(e)(1)(ii)(A)

The next component of a BART evaluation is to perform the BART analysis. BART is a source-specific control determination, based on consideration of several factors set out in section 169A(g)(2) of the CAA. These factors include the costs of compliance and the degree of improvement in visibility associated with the use of possible control technologies. The EPA issued BART Guidelines (Appendix Y to Part 51) in 2005 to clarify the BART provisions based on the statutory and regulatory BART requirements (70 FR 39164). The BART Guidelines describe the BART analysis as consisting of the following five basic steps:

- *Step 1: Identify All Available Retrofit Control Technologies,*
- *Step 2: Eliminate Technically Infeasible Options,*
- *Step 3: Evaluate Control Effectiveness of Remaining Control Technologies,*
- *Step 4: Evaluate Impacts and Document the Results, and*

- *Step 5: Evaluate Visibility Impacts*

We note the BART Guidelines provide that states must follow the guidelines in making BART determinations on a source-by-source basis for 750 MW power plants but are not required to use the process in the guidelines when making BART determinations for other types of sources. States with subject-to-BART units with a generating capacity less than 750 MW are strongly encouraged to follow the BART Guidelines in making BART determinations, but they are not required to do so. However, the requirement to perform a BART analysis that considers "the technology available, the costs of compliance, the energy and nonair quality environmental impacts of compliance, any pollution control equipment in use at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology," is found in 40 CFR 51.308(e)(1)(ii)(A) and the RHR, and applies to all subject-to-BART sources.

For three facilities, ConocoPhillips Co., Rhodia Inc., and Sid Richardson Carbon Company, the LDEQ submitted a BART analysis under 40 CFR 51.308(e)(1)(ii)(A). For each of these facilities, we propose to find that the BART analysis satisfies part of the requirements, but does not satisfy all of the requirements. A summary of our proposed findings for these facilities is provided below.

As previously discussed, we are proposing to find that the state should have identified Mosaic as being subject to BART and made a BART determination for the source. This is discussed in more detail in section IV.D.2 of this action.

Also, as discussed in the Executive Summary above, in an earlier proposed action EPA proposed a limited disapproval of the LA RH SIP (76 FR 82219). EPA's proposed limited disapproval is based on deficiencies in the LA RH SIP submittal arising from the state's reliance on the CAIR to meet certain regional haze requirements. States such as Louisiana that are subject to the requirements of the Transport Rule trading program only for NO_X must still address BART for EGUs for SO_2 and other visibility impairing pollutants. See, 76 FR at 82224. While we proposed on December 30, 2011 to issue a FIP to address the deficiencies in Louisiana's SIP associated with the BART requirements for NO_X for EGUs, we did not propose a FIP to address the deficiencies associated with the BART requirements for SO_2. Louisiana also relied on the CAIR in assessing the need for emissions reductions for SO_2 from EGUs to satisfy BART requirements. Consequently, Louisiana will have to re-evaluate EGUs with respect to SO_2 BART requirements.

State Submittal**:** Louisiana's Regional Haze SIP Appendix G contains the BART analysis provided by each of the three facilities subject to BART

For the sources that the LDEQ identified as BART-eligible, and were not exempt from the BART requirements via dispersion modeling analyses and/or the use of model plants, the LDEQ must make a determination of BART for each BART-eligible source in Louisiana that emits any air pollutant which may reasonably be anticipated to cause or contribute to any impairment of visibility in any mandatory Class I Federal area. All such sources are subject to BART. The determination of BART must be based on an analysis of the best system of continuous emission control technology available and associated emission reductions achievable for each BART-eligible source that is subject to BART within the State.

a. ConocoPhillips

The ConocoPhillips Alliance Refinery is a petroleum refinery near Belle Chasse Louisiana and is a subject-to-BART source. On December 5, 2005, ConocoPhillips and the EPA entered into a Consent Decree (CD).[34] *The BART engineering analysis, provided by ConocoPhillips utilized emission reductions that are mandated per the CD for the fluidized catalytic cracker, the process refinery flares and the crude unit heater. Implementing these control projects per the CD emissions reductions will result in reducing the overall site visibility impacts. The visibility improvements resulting from this CD are discussed below. However, the LDEQ did not provide a complete BART evaluation for these units. The submittal does not analyze controls for these units using the five steps as required by 40 CFR 51.308(e). Also, no emissions limits for BART for these units were included in the LA RH SIP. Therefore, for the units covered by the CD, the LDEQ must provide BART analyses for the units to meet BART requirements (40 CFR 51.308(e)(1)(ii)(A)).*[35] *Also, a unit's BART emissions limits must be a part of the RH SIP, and therefore the LDEQ must include the BART emissions limits in the RH SIP through a SIP revision.*[36] *We propose to find that the BART determination for ConocoPhillips Alliance Refinery is deficient at this time.*

There are several other units subject to BART at the ConocoPhillips Alliance facility. These include the cooling water tower and gas-fired heaters. Louisiana provided a BART analysis for these as follows: cooling water tower for PM and PM_{10}, and process heaters for NO_X. For these units, ConocoPhillips determined, and the LDEQ agreed that there was not a cost effective control. We are proposing to accept the LDEQ's BART analysis that no additional controls are required to meet BART for these units.

For three other units, the emissions of PM, SO_2, and NO_X are minimal; so, the potential visibility improvement from controls on these units is also minimal. These units are the Product Dock No. 1 MVR Loading, the Product Dock No. 2 MVR Loading, and Coke Transfer and Storage. For detailed information, see the TSD section IV.D.3.a.iii and TSD Appendix A. The installation of any additional controls would likely achieve negligible emissions reductions, have almost no visibility impact on Breton, and would not be cost-effective.[37] *We propose to find that the LDEQ's analysis for these units is adequate to meet BART requirements.*

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[34] Civil Action No. H-05-0285. A copy of this CD is available in the docket for this rulemaking.

[35] The EPA recently finalized action approving New Jersey's BART determinations for the ConocoPhillips Bayway Refinery, which is subject to the same CD as the ConocoPhillips Alliance Refinery. *See* http://www.epa.gov/compliance/resources/cases/civil/caa/conocophillips.html. The proposal for that action explains that the EPA's approval is based on New Jersey's submittal of a complete BART evaluation for the subject-to BART units at the facility, and the fact that these units will be controlled "based on maximum feasible controls or a multi-factor analysis." 76 FR 49711, at 49721; *see also*, 77 FR 19-01. The TSD for that action describes how New Jersey's submittal included the BART analysis for NO_X, SO_2, and PM for the subject-to-BART units at this source in compliance with 40 CFR 51.308(e)(1)(ii)(A). TSD, pages 27-29, *available at* http://www.regulations.gov, Docket number EPA-R02-OAR-2011-0607.

[36] The CAA requires RH SIPs to "to contain such emission limits. . . necessary to make reasonable progress toward meeting the national goal. . . ." CAA 169A(b)(2). The federal regulations further explain that the state must "submit an implementation plan containing emission limits representing BART and schedules for compliance with BART for each BART-eligible source that may reasonably be anticipated to cause or contribute to any impairment of visibility in any mandatory Class I Federal area." 40 CFR 51.308(e). Finally, the preamble to the RHR states that "[t]he SIP revision must include the emission limitations determined to be BART for sources subject to BART . . . ." 64 FR 35714, at 35741.

[37] "Consistent with the CAA and the implementing regulations, States can adopt a more streamlined approach to making BART determinations where appropriate. Although BART determinations are based on the totality of circumstances in a given situation, such as the distance of the source from a Class I area, the type and amount of

State Submittal Regarding BART for this source: Chapter 9 and Appendix G, pp. 154 – 348

The ConocoPhillips Alliance refinery is located near Belle Chasse, which is approximately 94 kilometers from the Breton Class I area. The Alliance Refinery produces a wide range of petroleum products from crude oil, such as liquified petroleum gas, motor gasoline, jet fuel, diesel, carbon black feedstock, propane, and coke. The Alliance Refinery also produces petrochemicals such as benzene, toluene, xylenes, and by-product elemental sulfur. Emission sources at the Alliance Refinery include process heaters, boilers, storage vessels, loading facilities, fugitive emissions from equipment, process vents, and flares.

The LDEQ provided a BART Engineering Analysis and Modeling Report for the ConocoPhillips Alliance Refinery in an attachment dated July 5, 2007 as part of Appendix G of its submittal. The report was prepared under direction of ConocoPhillips and includes analysis by Sage Environmental Consulting. (LA RH SIP Appendix G, pp. 154 – 348).

For the units which are controlled by Consent Decree (see Table 10 below), the documentation provided does not analyze controls for each of the subject-to-BART units using the five steps as required by 40 CFR 51.308(e).

For two flares, we note that the CD and the LA RH SIP Appendix G may be referring to the same units, but the CD does not include the EPN numbers. Appendix A of the First Amendment to the CD refers to the "Low Pressure Flare (coker)" and "High Pressure Flare" for the Alliance Refinery; these may be the same units as the subject-to-BART units labeled "Low Pressure Flare" (EPN 308F-D-l) and "High Pressure Flare" (EPN 308F-D-2).

In order to satisfy BART requirements, Louisiana must either provide a BART analysis, or find that the controls required under the CD are among the most stringent. As discussed in 40 CFR Part 51 Appendix Y(IV)(D)(1)(9) and 70 FR 39165, if the State finds that the controls required under the CD are among the most stringent, then it will need to be consistent with the following (40 CFR Part 51 Appendix Y(IV)(D)(1)(9)):

> If you find that a BART source has controls already in place which are the most stringent controls available (note that this means that all possible improvements to any control devices have been made), then it is not necessary to comprehensively complete each following step of the BART analysis in this section. As long as these most stringent controls available are made federally enforceable for the purpose of implementing BART for that source, you may skip the remaining analyses in this section, including the visibility analysis in Step 5. Likewise, if a source commits to a BART determination that consists of the most stringent controls available, then there is no need to complete the remaining analyses in this section.

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pollutant at issue, and the availability and cost of controls, it is clear that in some situations, one or more factors will clearly suggest an outcome. Thus, for example, a State need not undertake an exhaustive analysis of a source's impact on visibility resulting from relatively minor emissions of a pollutant where it is clear that controls would be costly and any improvements in visibility resulting from reductions in emissions of that pollutant would be negligible. In a scenario, for example, where a source emits thousands of tons of SO_2 but less than one hundred tons of NO_X, the State could easily conclude that requiring expensive controls to reduce NO_X would not be appropriate. In another situation, however, inexpensive NO_X controls might be available and a State might reasonably conclude that NO_X controls were justified as a means to improve visibility despite the fact that the source emits less than one hundred tons of the pollutant." 70 FR 39116.

Also, a unit's BART emissions limits must be a part of the RH SIP, and therefore the LDEQ must include the BART emissions limits for all subject-to-BART units in the RH SIP through a SIP revision.

The emission units subject-to-BART are shown in Table 10,[38] with columns providing information for the units as follows:

- 5-factor analysis included? (Does the LA RH SIP Appendix G: ConocoPhillips Report included a 5-factor analysis for this unit?);
- De minimis emissions? (Are emissions from this unit De minimis?) More information about this column is provided in Appendix B to this TSD.
- Included in CD? (Is this unit included in the amended Consent Decree including the Alliance Refinery (Civil Action No. H-05-028)?
- Proposed Action? (What is EPA's proposed action for this unit with respect to the BART requirements?)

[38] Modified from a table in Appendix A within Appendix G of the Louisiana RH SIP.

Table 10. ConocoPhillips Alliance Refinery BART-Subject Units

EPN	Description	5-factor analysis included?[a]	De minimis emissions?[a, b]	Included in CD?[c]	Proposed Action?[d]		
					NO_X	SO_2	PM
308F-D-1	Low Pressure Flare*			Y	D	D	D
308F-D-2	High Pressure Flare*			Y	D	D	D
301-B-2A	CO Boiler			Y	D	D	D
301-B-2B	CO Boiler			Y	D	D	D
191-H-1	Crude Charge Heater			Y	D	D	D
292-H-1	Light Distillate Gulfiner Reactor Heater	Y			A	D	D
292-H-2	Light Distillate Gulfiner Stabilizer Heater	Y		Y	A	D	D
1291-H-2/3	FCCU Light/Heavy Feed Heater	Y		Y	A	D	D
191-H-2	Vacuum Charge Heater	Y		Y	A	D	D
891-H-1	Delayed Coker Charge Heater	Y		Y	A	D	D
491-H-1	Alkylation Isostripper Reboiler	Y		Y	A	D	D
491-H-2	Alkylation Depropanizer Reboiler	Y		Y	A	D	D
100-H-1	Coker Charge Storage Heater	Y			A	D	D
293-H-I	Heavy Distillate Gulfiner Reactor Feed Heater	Y		Y	A	D	D
293-H-2	Heavy Distillate Gulfiner Stabilizer Reboiler	Y		Y	A	D	D
1391-H-1	Catalytic Reformer Feed Heater No. 1	Y		Y	A	D	D
l391-H-2/3	Catalytic Reformer Feed Heater Nos. 2&3	Y		Y	A	D	D
1391-H-4	Depentanizer Reboiler	Y		Y	A	D	D
1391-H-5	Dry Reactivation Heater	Y			A	D	D
1791-H-1	Reformate Splitter Reboiler	Y		Y	A	D	D
I792-H-l	Hydrodealkylation Charge Heater	Y		Y	A	D	D
291-H-l	Naphiner Reactor Feed Heater	Y		Y	A	D	D
291-H-2	Naphiner Deisohexanizer Reboiler	Y		Y	A	D	D
303-R-1	Cooling Water Tower No. 1	Y			D	D	A
406-D-15	Product Dock No.1 MVR Loading**		Y		A	A	A
406-D-16	Product Dock No.2 MVR Loading**		Y		A	A	A
891-CP	Coke Transfer and Storage		Y		A	A	A

a Source: The LA RH SIP submittal, Appendix G; ConocoPhillips Report.
b Source: See Appendix B to this TSD.
c Source: Consent Decree and First and Second Amendments to the Consent Decree, Civil Action No. H-05-0285, which are in the docket for this action.
d "A" represents a proposed approval; "D" represents a proposed disapproval.
*Appendix A of the First Amendment to the Consent Decree includes for Alliance "Low Pressure Flare (coker)" and "High Pressure Flare," which may be the same as these units.
**Appendix A of the First Amendment to the Consent Decree includes for Alliance "Marine Vapor Recovery Flare – 406 D-15" and "Marine Vapor Recovery Flare – 406 D-16." However, the title for the units is shown as Product Dock No. 1 MVR Loading and Production Dock No. 2 MVR Loading in LA RH SIP Appendix G ConocoPhillips' Appendix A table "List of BART-Eligible Units Included in BART Modeling." It is unclear whether the CD addresses the subject to BART units identified by the same numbers.

BART Analysis Provided for ConocoPhillips Units

As mentioned above, the LDEQ provided a BART Engineering Analysis and Modeling Report for the ConocoPhillips Alliance Refinery in an attachment dated July 5, 2007 as part of Appendix G of its submittal (pp. 154 – 348). The report was provided by ConocoPhillips and includes analysis by Sage Environmental Consulting.

Cooling Water Towers. The LDEQ provided analysis for PM for Cooling Water Tower (303-R-1) as summarized below. The LDEQ did not provide BART analyses for NO_X or SO_2 for these sources, as emissions from these pollutants are minimal. As provided in Appendix A of ConocoPhillips' report which is within the LA RH SIP Appendix G, the Cooling Water Tower No. 1 emissions for SO_2 and NO_X are as follows:

EPN	Description	SO_2 (lb/hr)	NO_X (lb/hr)
303-R-1	Cooling Water Tower No. 1	0.0000	0.0000

Step 1- Identify All Available Retrofit Control Technologies: The LA RH SIP Appendix G identified the use of High Efficiency Drift Eliminator (HEDE) (high end), Drift Eliminator, and Good Operating Practices, as the only control options available for PM for the cooling water towers.

Step 2- Eliminate Technically Infeasible Options: None of the three control options is considered technically infeasible for the units in question.

Step 3- Evaluate Control Effectiveness of Remaining Control Technologies: The LA RH SIP Appendix G determined that a HEDE (high end) would have a control effectiveness of 99.51%, followed by a HEDE with a control effectiveness of 95.09%, a Drift Eliminator (industry standard) with a control effectiveness of 75.47%, and finally Good Operating Practices.

Step 4- Evaluate Impacts and Document the Results: The LA RH SIP Appendix G included an economic analysis for high end HEDEs and HEDEs using the EPA Air Pollution Control Cost Manual, Sixth Edition, 2002 (EPA/452/B-02-001), Chapter 3, Electrostatic Precipitators (ESP).

Based on the analysis in Steps 1-4, the LA RH SIP Appendix G found that using drift eliminators, and HEDEs to control PM from the cooling towers ranged in cost effectiveness from $231,436 to $441,462/ton of PM removed.

Step 5- Evaluate Visibility Impacts: The LA RH SIP Appendix G found that using drift eliminators and HEDEs to control PM from the cooling towers resulted in a visibility benefit that ranged from 0.165 to 0.173 dv. The LA RH SIP Appendix G concludes that, considering the cost and projected visibility benefits, neither control was cost effective.

Process Heaters. The LA RH SIP Appendix G provided analysis for NO_X for these units as summarized below. The LDEQ did not provide BART analyses for SO_2 and PM as emissions of this pollutant from these units are minimal. As provided in Appendix A of ConocoPhillips' report which is within the LA RH SIP Appendix G, emissions of NO_X for these units are as follows:

Step 1- Identify All Available Retrofit Control Technologies: The LA RH SIP Appendix G identified use of Selective catalytic reduction (SCR), Ultra-low NO_X burners (ULNB), Low NO_X burners (LNB), Flue gas recirculation (FGR), Selective non-catalytic reduction (SNCR), and Water injection as six control options available for NO_X for the heaters.

Step 2- Eliminate Technically Infeasible Options: Both Flue gas recirculation and Water injection were found to have significant drawbacks and thus were determined to be technically infeasible.

Drawbacks of LNB and SNCR were discussed, and a decision was made not to include either technology in the cost effectiveness evaluation for process heaters.

The two technologies considered to be potentially applicable options for the process heaters subject to BART were ULNB and SCR. Neither of these two control options was considered technically infeasible for the units in question.

Step 3- Evaluate Control Effectiveness of Remaining Control Technologies: The LA RH SIP Appendix G determined that the NO_X control effectiveness for the technologies considered was as follows: ULNB and SCR together are the most effective, followed by ULNB alone, SCR alone, and then Good Operating Practices.

Step 4- Evaluate Impacts and Document the Results: The LA RH SIP Appendix G provides an economic analysis for each of the technologies in Step 3 above (LA RH SIP Appendix G section 3.2.3 and Table 3-5 of the ConocoPhillips BART Engineering Analysis).

Step 5- Evaluate Visibility Impacts: The LA RH SIP Appendix G determined, and LDEQ agreed that, considering the estimated costs per delta deciview visibility improvement, using ULNB or SCR to control NO_X from the process heaters is not cost effective for improving visibility (LA RH SIP Appendix G section 3.2.3 and Table 3-5 of the ConocoPhillips BART Engineering Analysis).

Other Subject to BART Units

As shown in the LA RH SIP Appendix G, the following units have low emissions: Product Dock No. 1 MVR Loading, Product Dock No. 2 MVR Loading, and Coke Transfer and Storage. See the LA RH SIP Appendix G for more information. Appendix A of the First Amendment to the Consent Decree includes for Alliance "Marine Vapor Recovery Flare – 406 D-15" and "Marine Vapor Recovery Flare – 406 D-16." However, the title for the units is shown as Product Dock No. 1 MVR Loading and Production Dock No. 2 MVR Loading in LA RH SIP Appendix G ConocoPhillips' Appendix A table "List of BART-Eligible Units Included in BART Modeling."

It is unclear whether the CD addresses the subject to BART units identified by the same numbers. Please see TSD Appendix B for information about emissions from these units.

b. Rhodia

The Rhodia Sulfuric Acid plant is located in Baton Rouge. The Rhodia Sulfuric Acid plant produces sulfuric acid by using two sulfuric acid production trains, Unit 1 and Unit 2. Unit 1 was constructed in 1953, and at the time of the SIP submittal, had a production rate of 700 tons of sulfuric acid per day (700 tons sulfuric acid/day). Although Rhodia Unit 1 was constructed outside the dates for BART-eligibility, the LDEQ identified it as BART-eligible. Therefore, we treat it as BART-eligible and have included this unit in the subject-to-BART discussion in this section.[39] We request comments on whether this unit should be treated as BART-eligible. Unit 2 was constructed in 1968, and has a production rate of 1500 tons sulfuric acid/day. Therefore, Unit 2 is an "existing stationary facility" for purposes of BART eligibility, as defined in 40 CFR 51.301.

Effective July 23, 2007, the EPA, LDEQ and other parties entered into a CD with Rhodia requiring a scrubber to be installed on each of the units to control SO_2 emissions.[40] The BART engineering analysis assumed emission reductions that have since been mandated per the CD for Units 1 and 2. As stated above, without controls, the BART screening modeling for Rhodia showed a visibility impact at Breton of greater than 0.5 dv. Implementing control projects per the CD emissions reductions will result in reducing the overall site visibility impacts, and based on modeling with controls the LDEQ expects the visibility impairment from Rhodia to be below 0.5 dv at Breton. The visibility improvements resulting from this CD are discussed below. However, the LDEQ did not submit a complete BART evaluation for these units. The submittal does not analyze controls for the units using the five steps as required by 40 CFR 51.308(e). In order to satisfy BART requirements for SO_2, Louisiana must provide a BART analysis. The LDEQ may be able to find that the controls required under the CD are among the most stringent, and therefore, no additional controls would be required for these units to meet BART. 40 CFR 51 Appendix Y.IV.D.1.9. Also, the emissions limits for Rhodia's subject-to-BART units were not included in the RH SIP revision, so the LDEQ must include the BART emission limits in the RH SIP through a SIP revision.[41] We propose to find that the BART determination for Rhodia is deficient at this time.

The visibility impact due to NO_X and PM emissions from Rhodia's two subject-to-BART units is minimal; so, the potential visibility improvement from controls on these units is also minimal. For detailed information, see section IV.D.3.b of this TSD and TSD Appendix C. The installation of any additional controls would likely achieve negligible emissions reductions, have almost no visibility impact on Breton, and would not be cost-effective.[37] We propose to find the LDEQ's analysis for these pollutants is adequate to meet BART requirements.

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[39] We note it is possible for a source to have been constructed prior to the BART eligibility timeframe of August 7, 1962 to August 7, 1977, but to have been reconstructed during that timeframe and thus still BART-eligible. 70 FR 39159-60.

[40] Civil Action No. 2:07CV134 WL. A copy of this CD is available in the docket for this rulemaking.

[41] CAA 169A(b)(2); 40 CFR 51.308(e); and 64 FR 35714, at 35741.

State Submittal Regarding Rhodia: Chapter 9 and Appendix G, pp. 138 – 153, including information for SO_2 NO_X and PM BART for Units 1 and 2 (Rhodia BART Engineering Analysis, letter dated June 11, 2007, Table 1)

The LDEQ provided documentation about the Rhodia facility dated June 14, 2007 as part of Appendix G of its submittal: "Summary of CALPUFF BART screening Modeling Analysis for Rhodia Sulfuric Acid Plant." The document was provided by Rhodia and includes analysis by Providence Engineering and Environmental Group, LLC (Providence). (LA RH SIP Chapter 9 and Appendix G pp. 138 – 153).

Unit 2 was constructed in 1968, and has a production rate of 1500 tons sulfuric acid/day.

For Unit 2, the CD required a scrubber by January 1, 2011 and required a scrubber on Unit 1 by May 1, 2012. The scrubber on Unit 2 began operating in November 2010. The two scrubbers are projected to reduce emissions from these plants by approximately 94%, and generate several thousand tons per year of SO_2 reductions. According to Rhodia, the 94% control efficiency modeled in the abated scenario corresponds to long-term (annual average) emission limits required by the CD: 1.9 pounds of SO_2 emitted per ton of sulfuric acid produced (1.9 lb SO_2 emitted/ton sulfuric acid produced) for Unit 1, and 2.2 lb SO_2 emitted/ton of sulfuric acid produced for Unit 2.

For SO_2, the documentation provided focused on Screening Modeling and does not analyze controls for the units using the five steps as required by 40 CFR 51.308(e).

In order to satisfy BART requirements for SO_2, Louisiana must either provide a BART analysis, or find that the controls required under the CD are among the most stringent (40 CFR Part 51 Appendix Y(IV)(D)(1)(9) and 70 FR 39165). If the State were to address these requirements with a BART analysis, it is possible that some of the information in the existing documentation would be useful. Alternatively, if the State addresses these requirements by finding that the controls required under the CD are among the most stringent, then it will need to be consistent with the following (40 CFR Part 51 Appendix Y(IV)(D)(1)(9):

> If you find that a BART source has controls already in place which are the most stringent controls available (note that this means that all possible improvements to any control devices have been made), then it is not necessary to comprehensively complete each following step of the BART analysis in this section. As long as these most stringent controls available are made federally enforceable for the purpose of implementing BART for that source, you may skip the remaining analyses in this section, including the visibility analysis in Step 5. Likewise, if a source commits to a BART determination that consists of the most stringent controls available, then there is no need to complete the remaining analyses in this section.

Also, a unit's BART emissions limits must be a part of the RH SIP, and therefore the LDEQ must include the BART emissions limits in the RH SIP through a SIP revision.

c. Sid Richardson Carbon Company

The Sid Richardson Carbon Company is a subject-to-BART source located in West Baton Rouge Parish. For the subject-to-BART units at the Sid Richardson facility, Sid Richardson/LDEQ submitted a BART engineering analysis. For PM, the LDEQ determined that the high efficiency fabric filters already in use at the facility are BART. We propose to find that the state acted within its discretion in making this determination, and that the PM analyses provided by the LDEQ and Sid Richardson meet BART requirements.

For NO_X, the LA RH SIP Chapter 9 states that the Sid Richardson engineering analyses included the potential installation of NO_X add-on controls, but it determined that all were infeasible (there were no demonstrated NO_X scrubbing technologies at any carbon black plants). However, there is not sufficient information in the LA RH SIP submittal to support the BART analysis conclusion that no controls are feasible. We propose to find that the NO_X BART determination for Sid Richardson is deficient at this time.

For SO_2, the LA RH SIP Chapter 9 states that the Sid Richardson engineering analyses included the potential installation of SO_2 add-on controls, but it determined that all were infeasible (there were no demonstrated SO_2 scrubbing technologies at any carbon black plants). However, Appendix G of the LA RH SIP submittal reflects that the SO_2 evaluation for Sid Richardson considered four potential approaches and evaluated them for cost effectiveness: three add-on controls – caustic scrubbing, wet limestone scrubbing, and Haldor Topsoe's SNOX process, which is a process that removes SO_2, NO_X and PM from flue gas; the fourth approach would be to limit the sulfur content of the feedstock oil.[42] The SIP documentation does not reconcile the cost analyses provided with the corresponding conclusion of the technical infeasibility for these same control options. Based on the cost analysis provided, the installation and use of scrubbers to control emissions may be well within a range that is cost effective. Also, the LDEQ indicated that no controls were technically feasible, but the record does not provide a sufficient basis for this conclusion. There is not sufficient information in the LA RH SIP submittal to support the BART analysis conclusion that a scrubber, or other technology, is not feasible. For these reasons, we propose to find that the SO_2 BART determination for Sid Richardson is deficient at this time.

State Submittal Regarding SO_2 and PM BART Determinations (natural gas): Chapter 9 and Appendix G, pp. 1 – 137

The Sid Richardson Plant is located in Addis, West Baton Rouge Parish, approximately 234 km from Breton. The LDEQ provided a BART Engineering Analysis for the Sid Richardson Carbon Company, (the Addis Plant) in a report dated June 13, 2007, which is included in the LA RH SIP as part of Appendix G (pp. 1 – 137). This report, which will be referred to hereafter as the "LA's Sid Richardson BART Analysis", was prepared for the Sid Richardson Carbon Company, Ltd., Fort Worth, Texas, by Environ International Corporation and includes analysis by Environ. The Sid Richardson plant operates three carbon black production process trains, designated Units 1, 2, and 3. The plant produces carbon black by the oil furnace process in the following steps: reaction, primary filtering, flaring, pelletizing, and drying. Each unit operates with four reactors per reactor train, as shown in Figure 2-3 of the Environ BART Analysis for Sid Richardson, Appendix G of the LA RH SIP.

[42] LA RH SIP submittal TSD Appendix G, Environ Report, pg 14.

As presented in section 3.2 of this same report (Environ BART Analysis for Sid Richardson, Appendix G of the LA RH SIP), the following units at Sid Richardson are subject to BART:

- Reactors 1, 2, 3, 4, 5, 6, 7, 8, 9 10 and associated flares
- Primary and secondary carbon black conveyance for Units 1, 2 and 3 (primary and secondary bag filters)
- Dryers 2, 3, and 4 (Dryers 1, 5, and 6 are not BART eligible)
- Dried carbon black conveyance for Dryers 2, 3, and 4.

As shown in Table 3-1 of LA's Sid Richardson BART Analysis, the primary pollutant from the Addis Plant is SO_2, constituting more than 90% of emissions. For example, during the year 2002, which had the highest production of the period 2001-2003, the maximum 24-hour actual emissions rate were as follows: NO_X, = 1,039 lb/day, PM_{10} = 1,752 lb/day, and SO_2 = 38,968 lb/day (NO_X, = 190 ton/yr, PM_{10} = 320 ton/yr, and SO_2 = 7,112 ton/yr). For the subject-to-BART units at the Sid Richardson facility, LDEQ submitted a BART engineering analysis, as provided in the LA RH SIP Chapter 9 and Appendix G.[43]

For PM, the LA RH SIP Appendix G Sid Richardson BART analysis states that Sid Richardson currently employs fabric filters capable of a vendor guaranteed efficiency of 99.923%. It reviewed other PM control technologies such as HEPA/ULPA filters, and wet scrubbing technologies and concluded those controls are infeasible due to their not having been proven at carbon black facilities. The LA RH SIP Appendix G concluded that PM BART is the current level of control provided by the existing fabric filters. The EPA does not take a position on the feasibility of these additional PM control technologies. However, we note the already high capture efficiency of the current fabric filters, and that most of the emissions at the Sid Richardson facility are SO_2.

In the NO_X and SO_2evaluations provided in the LA RH SIP Appendix G, although not specifically stated, the LA RH SIP Appendix G appears to conclude that for the purpose of a BART determination, an undemonstrated technology is equivalent to a demonstration of technical infeasibility. We disagree with this conclusion and note that the BART Guidelines provide clarification:

> In general, a commercially available control option will be presumed applicable if it has been used on the same or a similar source type. Absent a showing of this type, you evaluate technical feasibility by examining the physical and chemical characteristics of the pollutant-bearing gas stream, and comparing them to the gas stream characteristics of the source types to which the technology had been applied previously. Deployment of the control technology on a new or existing source with similar gas stream characteristics is generally a sufficient basis for concluding the technology is technically feasible barring a demonstration to the contrary ….

[43] Best Available Retrofit Technology Analysis, Sid Richardson Carbon Company, Ltd., Addis, Louisiana, Plant, AI Number 4174, Prepared for: Sid Richardson Carbon Company, Ltd., Fort Worth, Texas. Prepared by: Steven H. Ramsey, Christopher J. Colville, ENVIRON International Corporation, May, 2007, Project No. 26-18167A.

The BART Guidelines further provide clarification concerning what could determine technical infeasibility. These include an evaluation of the characteristics of the pollutant-bearing gas stream and the capabilities of the technology, or a showing that there are unresolvable technical difficulties with applying the control to the source. No such showing was made.

Sid Richardson operates three carbon black production process trains designated as Unit 1, Unit 2, and Unit 3. These units produce carbon black by the oil furnace process in four steps: reaction, primary filtering and flaring, pelletizing, and drying. Each Unit operates with four reactors per reactor train, as shown in Figure 2-3 of the Environ BART Analysis for Sid Richardson, Appendix G of the LA RH SIP).

A summary of the LA RH SIP Appendix G Sid Richardson BART analysis for PM, NOx and SO_2 is presented below. Unless otherwise identified, LA RH SIP Appendix G is the source of quoted material.

PM

Step 1- Identify All Available Retrofit Control Technologies:

The LA RH SIP Appendix G considered the following control approaches for stationary sources of PM: mechanical separators, electrostatic precipitation, fabric filtration, wet scrubbing, high efficiency particle air (HEPA) filters and Ultra-Low Penetration Air (ULPA) filters.

Step 2- Eliminate Technically Infeasible Options:

". . . Based on review of EPA's [RACT BACT LAER] Clearinghouse and knowledge of current emission control practices in the carbon black manufacturing industry, it is our opinion that the Sid Richardson Addis Plant meets current BACT for the control of PM." LA RH SIP Appendix G.

NO_X

Step 1- Identify All Available Retrofit Control Technologies:

The LA RH SIP Appendix G considered various controls for two approaches for control of NO_X emissions: modifications to the combustion process (e.g., ULNB, over fire air) that prevent the formation of NO_X, and post-combustion controls that remove NO_X from the flue gas (SNCR and SCR), as well as Non-selective Catalytic Reduction (NSCR), and wet chemical scrubbers.

Step 2- Eliminate Technically Infeasible Options:

Reactors: The LA RH SIP Appendix G found that none of the options identified in Step 1 of the analysis are technically feasible. From pdf p. 16 of Appendix G: ". . . To the best of our knowledge, none of the identified potentially available combustion modification options have ever been employed in a carbon black reactor. For these reasons, implementing combustion modifications for the purpose of preventing the formation of NO_X in the reactors is not considered to be technically feasible." Also for SNCR, SCR, and NSCR, to the best of their knowledge, neither SNCR, SCR, nor NSCR has ever been used to control emissions from a carbon black reactor and therefore is not considered to be technically feasible. For the various adsorption and absorption processes identified by EPA to control NO_X emissions, "Since the combustion gases are already in direct contact with the carbon black produced in the reactors, Sid Richardson is, in practice, already employing carbon adsorption to reduce NO_X emissions" For the use of wet chemical scrubbers, . . . "It is our understanding that there are a limited number of industrial applications in actual operation and that there are no wet chemical scrubbers

in use at carbon black manufacturing facilities. Therefore, we are of the opinion that this is not a demonstrated technology for the control of NO_X emissions from the reactors." (p. 16 – 17, Appendix G). "We are of the opinion that the Sid Richardson Addis Plant reactors meet current Best Available Control Technology (BACT) for NO_X.

Flares. "There are no options currently available for the direct control or elimination of NO_X emissions resulting from the combustions of flare pilot gas . . . Sid Richardson's flares meet current BACT."

Dryers: "To the best of our knowledge, none of the identified potentially available combustion modification options have ever been employed in a carbon black reactor. For these reasons, combustion modifications are not considered to be technically feasible for the control of NO_X emissions from the dryers." Also for SNCR, SCR, and NSCR, to the best of their knowledge, none of these as ever been used to control emissions from a carbon black reactor and therefore are not considered to be technically feasible for the control of NO_X emissions from the dryers. For the various adsorption and absorption processes identified by the EPA to control NO_X emissions, "We are not aware that adsorption and/or absorption processes have ever been used to control NO_X emissions from rotary dryers are carbon black plants." For the use of wet chemical scrubbers, . . . "there are a limited number of industrial applications in actual operation and that there are no wet chemical scrubbers in use at carbon black manufacturing facilities. Therefore, we are of the opinion that this is not a demonstrated technology for the control of NO_X emissions from the reactors." (p. 18, Appendix G). "We are of the opinion that the Sid Richardson Addis Plant dryers meet current BACT for NO_X."

SO_2:

Step 1- Identify All Available Retrofit Control Technologies:
The LA RH SIP Appendix G included an analysis for Best Available Control Technology (BACT) for SO_2 in a permit application to LDEQ in January 2006, which it provided as Attachment C of its report. These SO_2 controls included SCOSOx, Adsorption, Turbosonic adsorption, FLEXSORB, Regenerative gas desulfurization, H2S removal, limestone or caustic scrubbing, wet gas scrubbers, E-LIDS, Claus, SNOX, Sulferox, and flue gas deacidification.

Step 2- Eliminate Technically Infeasible Options:
Sulfur removal technologies and a summary of their technical feasibility were provided in Table 3.3-3 of the LA RH SIP Appendix G (p. 130 of 348).

The above referenced BACT analysis makes the following statement regarding the technical feasibility of SO_2 controls:[44]

> The only control techniques determined to be technically feasible were the limiting of feedstock sulfur content or the installation of the following add-on control devices:
>
> - an adsorption process by Selective Adsorption Associates, Inc.,

[44] Ibid., pdf page 137.

- the DynaWave System using limestone or caustic scrubbing material by Monsanto-Envirochem, and
- the SNOX sulfur recovery/conversion process by Haldor Topsoe.

For SO_2, the LA RH SIP Appendix G determined that, "[t]he Sid Richardson Company's … engineering analysis included the potential installation of … SO_2 add-on controls but deemed that all were infeasible (there were no demonstrated … SO_2 technologies at any carbon black plants). No work standard or practice was proposed nor does the department believe a work standard or practice is available."[45] However, in our review we found that Sid Richardson's BART analysis included a January 2006 PSD *BACT* evaluation to support its discussion of potential retrofit controls for its subject to BART emissions units.[46] As presented within that 2006 *BACT* evaluation by Sid Richardson, four potential approaches were considered and evaluated for cost effectiveness: three add-on controls – caustic scrubbing, wet limestone scrubbing, and Haldor Topsoe's SNOX process, which is a process that removes SO_2, NO_X and PM from flue gas. The Sid Richardson' 2006 *BACT* evaluation determined that add-on SO_2 controls have not been considered BACT for carbon black plants and no carbon black plant in the U.S. has installed add-on SO_2 controls; therefore they are considered undemonstrated. The fourth approach would be to limit the sulfur content of the feedstock oil. As explained in the LA RH SIP submittal, "[t]he conclusion of the BACT analysis is that limiting the sulfur content of the feedstock oil is the only technically and economically feasible option. That limitation is already reflected in the Addis Plant emission limits."[47]

Step 3- Evaluate Control Effectiveness of Remaining Control Technologies:
The techniques determined to be technically feasible were

a) The limiting of feedstock sulfur content, or

The installation of add-on control devices:

b) An adsorption process (Selective Adsorption)
c) Limestone or caustic scrubbing (DynaWave)
d) SNOX sulfur recovery/conversion process (Haldor Topsoe)

All three add-on control technologies could achieve at least 95% reduction in SO_2 (post-combustion.) We note that the control effectiveness of limiting the feedstock sulfur content is provided in Appendix G, Sid Richardson, Table 3.3-4.

Step 4- Evaluate Impacts and Document the Results:

The BACT analysis referenced above presented cost data for caustic scrubbing, limestone scrubbing, and SNOX controls ranging from $479 to $1,560 per ton of SO_2 removed. The LA RH SIP Appendix G found that the capital cost of installing scrubbers was $4.3 – 4.6 million. This corresponded to an annual cost-effectiveness for caustic scrubbing of $1,020/ SO_2 ton removed for and to a cost-effectiveness for limestone scrubbing of $479/ SO_2 ton removed.

More specifically, the LA RH SIP Appendix G provided cost information for the following control techniques:

[45] Page 53 of the Louisiana Regional Haze SIP.
[46] Attachment C to the Sid Richardson BART analysis.
[47] LA RH SIP submittal TSD Appendix G, Environ Report, pg 14.

a) The limiting of feedstock sulfur content ($2,418 per ton SO_2 produced);

The installation of add-on control devices:
b) Adsorption process ($3 million per day)
c) Limestone or caustic scrubbing
(capital cost of installation 4.3 – 4.6 million, and also disposal costs);
Caustic: $1,020 per ton (annual cost); Limestone: $479 per ton
d) SNOX sulfur recovery/conversion process (Haldor Topsoe) $1,560 per ton.

Step 5- Evaluate Visibility Impacts:

The LA RH SIP Appendix G did not evaluate the visibility impacts of those control options considered in Step four of the BART analysis, and did not compare the visibility improvements resulting from use of the control systems.

D.5. De Minimis BART: 40 CFR 51.308(e)(1)(ii)(C)

A determination of BART is required for each BART-eligible source in Louisiana that emits any air pollutant which may reasonably be anticipated to cause or contribute to any impairment of visibility in any mandatory Class I Federal area. All such sources are subject to BART. Louisiana is not required to make a determination of BART for SO_2 or for NO_X if a BART-eligible source has the potential to emit less than 40 tpy of such pollutant(s), or for PM_{10} if a BART-eligible source has the potential to emit less than 15 tpy of such pollutant. We find that this requirement is not applicable to the LA RH SIP at this time. This provision may be re-considered upon receipt of all BART analyses from LDEQ.

D.6. Design, Equipment, or Work Practice BART: 40 CFR 51.308(e)(1)(iii)

If Louisiana determines in establishing BART that technological or economic limitations on the applicability of measurement methodology to a particular source would make the imposition of an emission standard infeasible, it may instead prescribe a design, equipment, work practice, or other operational standard, or combination thereof, to require the application of BART. Such standard, to the degree possible, is to set forth the emission reduction to be achieved by implementation of such design, equipment, work practice or operation, and must provide for compliance by means which achieve equivalent results. Because LDEQ did not specifically require any design, equipment, or work practice BART at any BART-eligible facilities at the time of its June 13, 2007 submittal, we find that this requirement is not applicable to the LA RH SIP at this time. This provision may be re-considered upon receipt of all BART analyses from LDEQ.

D.7. Installation of BART: 40 CFR 51.308(e)(1)(iv) – (v)

Each source subject to BART must (1) install and operate BART as expeditiously as practicable, but in no event later than 5 years after approval of the SIP revision, and (2) maintain the control equipment required by this subpart and establish procedures to ensure such equipment is properly operated and maintained. We will re-evaluate this requirement upon receipt of all BART analyses from LDEQ.

D.8. CAIR for BART: 40 CFR 51.308(e)(2)-(4)

This is discussed primarily in section I above.

D.9. Reasonable Progress and BART: 40 CFR 51.308(e)(5)

After a state has met the requirements for BART or implemented emissions trading program or other alternative measure that achieves more reasonable progress than the installation and operation of BART, BART-eligible sources will be subject to the requirements of paragraph (d) of this section in the same manner as other sources. We will re-evaluate this requirement upon receipt of all BART analyses from LDEQ.

D.10. BART Exemptions: 40 CFR 51.308(e)(6)

Any BART-eligible facility subject to the requirement under paragraph (e) of this section to install, operate, and maintain BART, may apply to the Administrator for an exemption from that requirement. An application for an exemption will be subject to the requirements of 40 CFR 51.303(a)(2)–(h). We will re-evaluate this requirement upon receipt of all BART analyses from LDEQ.

E. Long-Term Strategy

As described in section III.E of this action, the LTS is a compilation of state-specific control measures relied on by the state for achieving its RPGs. Louisiana's LTS for the first implementation period addresses the emissions reductions from federal, state, and local controls that take effect in the state from the end of the baseline period starting in 2004 until 2018. The Louisiana LTS was developed by the LDEQ, in coordination with the CENRAP RPO, through an evaluation of the following components: (1) construction of a CENRAP 2002 baseline emission inventory (EI); (2) construction of a CENRAP 2018 EI, including reductions from the CENRAP member state controls required or expected under federal and state regulations, (including BART); (3) modeling to determine visibility improvement and apportion individual state contributions; (4) state consultation; and (5) application of the LTS factors.

Louisiana, as with each State listed in 40 CFR 51.300(b)(3), must submit a LTS that addresses regional haze visibility impairment for each mandatory Class I Federal area within the state and for each mandatory Class I Federal area located outside the state which may be affected by emissions from within the state. The long-term strategy must include enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals established by States having mandatory Federal Class I areas.

1. Emissions Inventories 40 CFR 51.308(d)(3)(iii) – (iv)

40 CFR 51.308(d)(3)(iii) requires that Louisiana document the technical basis, including modeling, monitoring and emissions information, on which it relied upon to determine its apportionment of emission reduction obligations necessary for achieving reasonable progress in each mandatory Class I Federal area it affects. Louisiana must identify the baseline emissions inventory on which its strategies are based. 40 CFR 51.308(d)(3)(iv) requires that Louisiana identify all anthropogenic sources of visibility impairment considered by the state in developing its long-term strategy. This includes major and minor stationary sources, mobile sources, and area sources. Louisiana met these requirements by relying on technical analyses developed by its RPO, CENRAP, and approved by all state participants, as described below.

The EI used in the RH technical analyses was developed by the CENRAP with assistance from Louisiana. The LDEQ provided a statewide EI for 2002, representing the mid-point of the

2000-2004 baseline period, and a projected EI for 2018, the end of the first 10-year planning period. The 2018 EI is based on visibility modeling conducted by the CENRAP. The 2018 EI was developed by projecting 2002 emissions and applying reductions expected from federal and state regulations affecting the emissions of the visibility-impairing pollutants NO_X, PM, SO_2, and VOCs.

State Submittal**:** Chapter 7 Emission Inventory, Chapter 8 Modeling Assessment, and Chapter 6 Monitoring

40 CFR 51.308(d)(3)(iii) requires that Louisiana document the technical basis, including modeling, monitoring and emissions information, on which it relied to determine its apportionment of emission reduction obligations necessary for achieving reasonable progress in each mandatory Class I Federal area it affects. It may meet this requirement by relying on technical analyses developed by the regional planning organization and approved by all State participants. Louisiana must identify the baseline EI on which its strategies are based. The baseline EI year is presumed to be the most recent year of the consolidated periodic EI. 40 CFR 51.308(d)(3)(iv) requires that Louisiana identify all anthropogenic sources of visibility impairment considered by the state in developing its long-term strategy. This includes major and minor stationary sources, mobile sources, and area sources. Louisiana met these requirements by relying on technical analyses developed by its RPO, CENRAP, and approved by all state participants, as described below.

We find that Louisiana has adequately documented the technical basis, including modeling, monitoring, and emissions information, on which it relied upon to determine its apportionment of emission reduction obligations necessary for achieving reasonable progress in each mandatory Class I federal area it affects.[48] We also find that Louisiana has adequately identified all anthropogenic sources of visibility impairment it considered in developing its LTS. We therefore propose to find that Louisiana has satisfied the requirements under 40 CFR 51.308(d)(3)(iii) – (iv).

The following discussion of EIs for the 2002 base and 2018 future year, 2002 and 2018 photochemical modeling results, and our review of the results is a brief summary of the work that was done and our conclusions. For a more detailed discussion of the technical analyses including the photochemical modeling and our review and conclusions concerning what pollutants are causing regional haze in Breton, see TSD Appendix A.

Emissions Inventory, Chapter 7

The LDEQ developed the 2002 EI used for the regional haze technical analyses using estimates for four general categories of emissions sources: point, non-point, on-road mobile, and non-road mobile. For point sources, the LDEQ used the EPA's 2002 biogenic source EI and completed the 2002 point source inventory with emission inventory reports which were provided by facilities following state and federal guidelines (utilizing AP-42 or other approved methods). For nonpoint sources, the LDEQ used in the regional haze technical analyses was developed by E.H. Pechan & Associates, Inc. through the CENRAP (see LA RH SIP, Appendix D). On-road mobile sources were estimated using the EPA's MOBILE6.2 motor vehicle emissions factor model. Non-road mobile emissions data was derived from the "Emission Inventory Development

[48] A detailed evaluation of the 2002 and 2018 EIs and the CENRAP visibility projection modeling, as well as a discussion of what pollutants are driving regional haze in Breton are found in TSD Appendix A.

for Mobile Sources and Agricultural Dust Sources for the Central States" produced by Sonoma Technology, Inc. for the CENRAP in October 2004 using the EPA's non-road emissions factor model, NONROAD 2004. Additional information about the LDEQ's EI development for 2002 is provided in the section "Louisiana 2002 Emission Inventory" below.

The 2018 EI was developed by projecting 2002 emissions using growth and control factors derived from the EGAS6, MOBILE6, and NONROAD models and applying reductions expected from federal and state regulations affecting the emissions of the visibility-impairing pollutants NO_X, PM, SO_2, and VOCs. The Integrated Planning Model (IPM) was used to forecast 2018 electric generating unit (EGU) emissions. The RHR directs states to exercise judgment in deciding whether VOCs and NH3 impair visibility in their 22 Class I area(s). 70 FR 39104, at 39160. As discussed in section III.F.1 below, Louisiana decided to not consider VOCs and ammonia among visibility-impairing pollutants for several reasons: 1) "an overwhelming majority of light extinction due to SO_4 caused by SO_2 emissions; 2) VOC emissions are currently addressed by the state in LAC 33:III.Chapter 21 Control of Emission of Organic Compounds; and 3) Ammonia emissions are addressed through the Louisiana Toxic Air Pollutant Emission Control Program LAC 33:III.Chapter 51 (see the LA RH SIP, Chapter 9, p. 36 for additional information).

a. Louisiana's 2002 Emission Inventory

The LDEQ and the CENRAP developed an EI for four inventory source classifications: point, area, non-road and on-road mobile sources for the baseline year of 2002. Louisiana's 2002 EI provides estimates of annual emissions for haze producing pollutants by source category as summarized in Table 11, based on information in Chapter 7 of Louisiana's RH SIP.

Table 11. Louisiana 2002 Emissions Inventory (tons/year)

	SO_2	NH_3	NO_X	VOCs	PM_{10}	$PM_{2.5}$
Point	286,050	9,237	312,634	89,025	73,333	60,899
Area	81,153	75,381	99,060	124,311	245,162	84,068
Non-road mobile	14,324	563	117,250	109,598	10,663	9,791
On-road mobile	4,653	3,748	15,137	64,643	3,563	2,689
Total	**386,180**	**88,929**	**544,081**	**387,577**	**332,721**	**157,447**

See below for details on how the 2002 EI was constructed. The EPA approved the 2002 EI on September 3, 2009 (74 FR 45561). We are proposing to find that Louisiana's 2002 EI is acceptable for the purpose of developing the LTS.

The source of data in Table 11 is the 2002 Base Year Inventory / Pechan (LA RH SIP Table 7.1)

Louisiana relied on several sources of information in developing the 2002 EI. For the baseline year 2002, the LDEQ developed the 2002 point source EI using emissions data provided by facilities, as well as the biogenic source inventory developed by the EPA. EI data for two inventory source categories, non-point sources and non-road mobile sources were provided by

contractors to the CENRAP. On-road mobile source emissions were estimated using the EPA's MOBILE 6.2 motor vehicle emissions factor model.

Non-point Sources. The nonpoint, or area source, inventory includes emitters of ozone pollutants (i.e., NO_X and VOCs), including sources that combust fuel (e.g., dry cleaners, degreasing, and industrial surface coating), as well as others such as gasoline distribution, asphalt paving, and fires and open burning (e.g., agricultural burning, structural fires, wildfires, prescribed burning). In addition, area source categories contributing to visibility pollutants (i.e., PM_{10}, $PM_{2.5}$, and NH_3) are also included in the area source EI (e.g., fugitive dust, agricultural operations, livestock ammonia, etc.). The contractor reviewed all emission factors used in the inventory to ensure they were the most appropriate and up-to-date emission factors available and checked all calculations for accuracy.

On-road Mobile Sources. The 2002 on-road mobile source emissions included emissions from vehicles certified for highway use. Emissions from these sources were estimated by combining EPA emission factors from the MOBILE6.2 model, expressed in grams per mile (g/mile), with vehicle miles traveled (VMT) activity data. County-level Highway Performance Monitoring System (HPMS) VMT data from the annual U.S. Highways Statistics Report (Section V) were used for all Louisiana counties. MOBILE6.2 emission factors were used in combination with the VMT data to estimate emissions by roadway type and vehicle type and vehicle class.

Non-road Mobile Sources. The 2002 nonroad mobile source emissions encompassed a wide variety of equipment types that moved or were moved within a 12-month period and are covered under the EPA's emissions regulations as nonroad mobile sources. The EPA's NONROAD2004 model version was used to estimate emissions for most nonroad sources. The NONROAD2004 model estimated emissions from non-road equipment in the following categories: agricultural equipment, airport ground support, construction equipment, industrial and commercial equipment, residential and commercial lawn and garden equipment, logging equipment, recreational equipment, and recreational marine vessels. Aircraft, commercial marine, and locomotive emissions were estimated separately and were also included in the non-road inventory.

Biogenic Emission Sources. Biogenic emissions were prepared with the SMOKE-BEIS3 (Sparse Matrix Operator Kernel Emission – Biogenic Emission Inventory System 3 version 0.9) preprocessor, which is a modified version of the Urban Air shed Model. The emission factors that are used in SMOKE-BEIS3 are the same as the emission factors as in the Biogenic Emissions Landcover Database version 3 (BELD3) provided by the EPA. A separate land classification scheme, based upon satellite (AVHRR, 1 km spatial resolution) and census information, aided in fining the forest, agriculture and urban portions of each county. For a full discussion of the EIs, see Chapter 2 of the LA TSD Appendix B.

Point Sources. For purposes of the EI, point sources are defined as stationary commercial or industrial operations that emit 100 tpy or more of VOC or NO_X, or lower thresholds in a nonattainment area. The LDEQ compiles a statewide EI for point sources on an annual basis. The reporting requirements for the nonattainment area are in accordance with those of the CAA

Amendments of 1990. Emissions data provided by the facilities are estimates of actual emissions for the facility during the previous calendar year. Estimation methodologies are required to follow state and federal guidelines utilizing AP-42 or other approved methods. Actual testing or measurement data must be substituted if available. Each facility meeting the emissions criteria submitted complete EI reports which contain site-specific data in conformance with EPA guidance for ozone maintenance areas.

b. Louisiana's 2018 Emission Inventory

In constructing Louisiana's 2018 EI, the LDEQ used a combination of our Economic Growth Analysis System (EGAS 6), our mobile emissions factor model (MOBILE 6), our off-road emissions factor model (NONROAD), and the Integrated Planning Model (IPM) for electric generating units. The CENRAP developed emissions for five inventory source classifications: point, area, non-road and on-road mobile sources, and biogenic sources. The CENRAP used the 2002 EI, described above, to estimate emissions in 2018. All control strategies expected to take effect prior to 2018 are included in the projected EI. Louisiana's 2018 EI provides estimates of annual emissions for haze producing pollutants by source category as summarized in Table 12, based on information in Chapter 7 of the Louisiana RH SIP.

Table 12. Louisiana's 2018 Emissions Inventory

	SO_2	NH_3	NO_X	VOCs	PM_{10}	$PM_{2.5}$
Point	354,087	14,435	269,215	187,741	73,136	60,899
Area	87,538	36,896	114,374	117,600	16,936	14,536
Non-road mobile	11,584	72	106,685	64,294	8,670	7,955
On-road mobile	561	5,436	44,806	30,340	1,191	1,191
Total	**453,770**	**56,839**	**535,080**	**399,975**	**99,933**	**84,581**

The CENRAP and LDEQ used this and other states' 2018 EIs to construct visibility projection modeling for 2018. We are proposing to find that Louisiana's 2018 EI is acceptable.

The source of data in Table 12 is the 2018 Base Year Inventory / Pechan (LA RH SIP Table 7.2)

As mentioned above, in developing emissions for five inventory source classifications, the CENRAP used the 2002 EI to estimate emissions in 2018. The CENRAP contractors compiled the growth and control assumptions and factors used to estimate point-source emissions in 2018 from the EI for 2002. This included EGUs, internal combustion engines and other non-EGU point sources. The CENRAP states provided data for the area source and non-road mobile EI for 2018, to which a CENRAP contractor applied area source growth and control factors. These control factors accounted for federal standards for commercial marine vessels and locomotives. For the remaining non-road mobile categories, the contractor ran our NONROAD2004 model for 2018. This accounted for estimated growth in equipment populations and incorporated anticipated effects of most final federal standards, including the Tier 4 compression-ignition engine standards and the exhaust emissions standards for large spark-

ignition engines, compression-ignition marine engines, and land-based recreational engines. The LDEQ and the CENRAP also developed the on-road mobile source EI for 2018 with contractor support. Biogenic emissions were held constant from the 2002 EI. Louisiana's 2018 EI is summarized in Table 12.

2. Visibility Projection Modeling

The CENRAP performed modeling for the RH LTS for its member states, including Louisiana. The modeling analysis is a complex technical evaluation that began with selection of the modeling system. The CENRAP used (1) the Mesoscale Meteorological Model (MM5) meteorological model, (2) the Sparse Matrix Operator Kernel Emissions (SMOKE) modeling system to generate hourly gridded speciated emission inputs, (3) the Community Multiscale Air Quality (CMAQ) photochemical grid model and (4) the Comprehensive Air Quality model with extensions (CAMx), as a secondary corroborative model. The CAMx was also utilized with its Particulate Source Apportionment Technology (PSAT) tool to provide source apportionment for both the baseline and future case visibility modeling.

The photochemical modeling of RH for the CENRAP states for 2002 and 2018 was conducted on the 36-km resolution national regional planning organization domain that covered the continental U.S., portions of Canada and Mexico, and portions of the Atlantic and Pacific Oceans along the east and west coasts. The CENRAP states' modeling was developed consistent with our guidance.[49]

The CENRAP examined the model performance of the regional modeling for the areas of interest before determining whether the CMAQ model results were suitable for use in the RH assessment of the LTS and for use in the modeling assessment. The 2002 modeling efforts were used to evaluate air quality/visibility modeling for a historical episode—in this case, for calendar year 2002—to demonstrate the suitability of the modeling systems for subsequent planning, sensitivity, and emissions control strategy modeling. Model performance evaluation is performed by comparing output from model simulations with ambient air quality data for the same time period to determine whether the model's performance is sufficiently accurate to justify using the model for simulating future conditions. Once the CENRAP determined the model performance to be acceptable, it used the model to determine the 2018 RPGs using the current and future year air quality modeling predictions, and compared the RPGs to the URP. The results of the CENRAP's visibility projection modeling are discussed in the section that follows. We are proposing to find that Louisiana's visibility projection modeling is acceptable.

Chapter 8 of the Louisiana Regional Haze SIP discusses modeling for PM and visibility, including the modeling methods and protocol used by the CENRAP and the LDEQ in developing the PM and visibility modeling assessment. Sections 8.1 and 8.2 describe the baseline EI used by the CENRAP in the Louisiana analysis. A detailed description and discussion of the model selection, modeling protocol, quality assurance, performance evaluation, EI development and data used in the regional haze analysis can be found in Appendix B of the LA RH SIP and references therein. A short summary is provided below:

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[49] Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze, (EPA-454/B-07-002), April 2007, located at http://www.epa.gov/scram001/guidance/guide/final-03-pm-rh-guidance.pdf. Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations, August 2005, updated November 2005 ("our Modeling Guidance"), located at http://www.epa.gov/ttnchie1/eidocs/eiguid/index.html, EPA-454/R-05-001.

The CENRAP performed modeling for the regional haze LTS for its member states, including Louisiana. The modeling analysis is a complex technical evaluation that began with selection of the modeling system. The CENRAP used the following modeling system:

- Meteorological Model: The Pennsylvania State University/National Center for Atmospheric Research (PSU/NCAR) Mesoscale Meteorological Model (MM5) is a nonhydrostatic, prognostic meteorological model routinely used for urban- and regional-scale photochemical, $PM_{2.5}$, and regional haze regulatory modeling studies.

- Emissions Model: The Sparse Matrix Operator Kernel Emissions (SMOKE) modeling system is an emissions modeling system that generates hourly gridded speciated emission inputs of mobile, non-road mobile, area, point, fire and biogenic emission sources for photochemical grid models.

- Air Quality Model: The EPA's Models-3/ CMAQ modeling system is a photochemical grid model capable of addressing ozone, PM, visibility and acid deposition at a regional scale. The photochemical model selected for this study was CMAQ version 4.5. It was modified by the CENRAP with a module for Secondary Organics Aerosols (SOA) in an open and transparent manner that was also subjected to outside peer review. The CAMx Version 4.40 model, applied using similar options as used by CMAQ, was used as a secondary corroborative model. CAMx was also utilized with its PSAT tool to provide source apportionment of predicted nitrate and sulfate aerosol concentrations.

The CMAQ and CAMx modeling of regional haze in the CENRAP region for 2002 and 2018 was carried out on a grid of 36x36 kilometer (km) cells that covers the continental United States, portions of Canada and Mexico, and portions of the Atlantic and Pacific Oceans along the east and west coasts. Selection of a representative period of meteorology is crucial for evaluating baseline air quality conditions and projecting future changes in air quality due to changes in emissions of visibility-impairing pollutants. The CENRAP conducted an in-depth analysis which resulted in the selection of the entire year of 2002 (January 1-December 31) as the best period of meteorology available for conducting the modeling. The CENRAP modeling was developed consistent with our guidance.[50]

The CENRAP examined the model performance of the regional modeling for the areas of interest before determining whether the CMAQ model results were suitable for use in the regional haze assessment of the LTS and for use in the modeling assessment. The modeling assessment predicts future levels of emissions and visibility impairment used to support the LTS and to compare predicted, modeled visibility levels with those on the URP. In keeping with the objective of the CMAQ modeling platform, the air quality model performance was evaluated using graphical and statistical assessments based on ambient measurements of PM species,

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[50] "Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze,"(EPA-454/B-07-002), April 2007, located at http://www.epa.gov/scram001/guidance/guide/final-03-pm-rh-guidance.pdf
See also "Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations," August 2005, updated November 2005 ("our Modeling Guidance"), located at http://www.epa.gov/ttnchie1/eidocs/eiguid/index.html, EPA-454/R-05-001

gas-phase species and wet deposition from various monitoring networks and databases for the 2002 base year. The CENRAP used a diverse set of statistical parameters from our Modeling Guidance to stress and examine the model and modeling inputs. Once the CENRAP determined the model performance to be acceptable, the CENRAP used the model to assess the 2018 RPGs using the current and future year air quality modeling predictions, and compared the RPGs to the URP.

The CENRAP modeling shows that Louisiana sources are projected to have contributions to the Class I areas in Louisiana, Oklahoma (Wichita Mountains), Arkansas (Caney Creek), and Texas. The contribution from Louisiana sources to Breton Class I area accounted for 15.75% of the visibility impairment in 2002, and is projected to account for 24.67% in 2018. Also, the contribution from Louisiana sources to the Wichita Mountains Class I area in Oklahoma, accounted for 3.47 % of the visibility impairment at Wichita Mountains in 2002 and is projected to account for 4.83% in 2018. Similarly, the contribution from Louisiana sources to the Caney Creek Class I area in Arkansas, accounted for 2.86 % of the visibility impairment at Caney Creek in 2002 and is projected to account for 4.83% in 2018. Louisiana is also projected to contribute a small amount of visibility degradation at Class I areas in other states listed in Table 13. Table 13 summarizes the projected contribution from Louisiana emissions on visibility degradation at 9 Class I areas for the 20 percent worst days in 2002 and 2018, as modeled by the CENRAP.[51] The CENRAP PSAT tool, which is included in the docket, allows for browsing through the model results in a number of different ways.

3. Sources of Visibility Impairment

Where Louisiana causes or contributes to impairment in a mandatory Class I Federal area, it must demonstrate that it has included in its SIP all measures necessary to obtain its share of the emission reductions needed to meet the progress goal for the area. If Louisiana has participated in a regional planning process, it must ensure it has included all measures needed to achieve its apportionment of emission reduction obligations agreed upon through that process.

40 CFR 51.308(d)(3)(ii) requires that, "Where other states cause or contribute to impairment in a . . . Class I area, the state must demonstrate that it has included . . . all measures necessary to obtain its share of the emissions reductions needed to meet the progress goal for the area. If the state has participated in a regional planning process, the state must ensure it has included all measures needed to achieve its apportionment of emission reduction obligations agreed upon through that process."

The CENRAP used CAMx with its PSAT tool to provide source apportionment by geographic region and major source category. The pollutants causing the highest levels of light extinction are associated with the sources causing the most visibility impairment.

a. Sources of Visibility Impairment in the Breton Class I Area

Visibility impairment at Breton in 2002 on the worst 20% days is primarily (69%) due to point source emissions that contribute 77.7 inverse megameters[52] (Mm^{-1}) of the total extinction

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[51] See the LA RH SIP, Appendix B, and within that Appendix E of the TSD for CENRAP Emissions and Air Quality Modeling to Support Regional Haze State Implementation.

[52] An inverse megameter is the direct measurement unit for visibility impairment data. It is the amount of light scattered and absorbed as it travels over a distance of one million meters. Deciviews (dv) can be calculated from extinction data as follows: $dv = 10 \times \ln (b_{ext}(Mm^{-1})/10)$.

of 122.1 Mm^{-1}. The largest contributions come from inside the state. In 2018, point sources continue to contribute the most to visibility impairment at Breton, even though this contribution has decreased substantially. "The top five contributing source groups to 2018 visibility impairment at [Breton] for the worst 20 percent days are: Louisiana Elevated Point Sources; Boundary Conditions;[53] East Elevated Point Sources; Gulf of Mexico Area Sources; and Louisiana Area Sources. Gulf of Mexico Area sources include off shore shipping and oil and gas development emissions."[54] We are proposing to find that Louisiana's identification of sources of visibility impairment for the Breton Class I area is acceptable.

b. Louisiana's Contribution to Visibility Impairment in Class I Areas Outside the State

Table 13 shows the CENRAP CAMx and PSAT modeled contributions (in percentage of visibility impacts) to total extinction at all Class I areas from Louisiana sources for 2002 and 2018, respectively. The CAMx PSAT results were utilized to evaluate the impact of Louisiana emission sources in 2002 and 2018 on visibility impairment at Class I areas outside of the state.

Table 13. Percent Contribution from Louisiana Emissions to Total Visibility Impairment at Class I areas on 20% Worst Days

Class I area	State	2002	2018
Breton (BRET1)	Louisiana	15.75	24.67
Wichita Mountains (WIMO1)	Oklahoma	3.47	4.83
Caney Creek (CACR1)	Arkansas	2.86	4.23
Big Bend NP (BIBE1)	Texas	2.79	3.32
Upper Buffalo Wilderness (UPBU1)	Arkansas	1.80	2.71
Hercules Glades Wilderness (HEGL1)	Missouri	1.71	2.43
Guadalupe Mountains NP (GUMO1)	Texas	1.32	1.57

[53] "Boundary Conditions" means "the assumed concentrations along the later edges of the 36 km modeling domain." LA RH SIP submittal Appendix B, Environ Report, p. 1-16.

[54] LA RH SIP submittal Appendix B, Environ Report, p. 5-18.

White Mountain Wilderness (WHIT1)	New Mexico	1.28	1.44
Sipsey Wilderness (SIPS1)	Alabama	0.96	1.78
Salt Creek (SACR1)	New Mexico	0.93	1.07
Mammoth Cave NP (MACA1)	Kentucky	0.67	1.19
Seney (SENE1)	Michigan	0.54	0.77
Bosque del Apache (BOAP1)	New Mexico	0.42	0.48
Great Smoky Mountains NP (GRSM1)	Tennessee	0.40	0.83
Isle Royale NP (ISLE1)	Michigan	0.39	0.49
Badlands NP (BADL1)	South Dakota	0.36	0.41
Cadiz (CADI1)	Kentucky	0.34	0.59
Gila Wilderness (GICL1)	New Mexico	0.30	0.37
Bondville (BOND1)	Illinois	0.27	0.41
Mingo (MING1)	Missouri	0.22	0.33
Bandelier (BAND1)	New Mexico	0.21	0.24
San Pedro Parks (SAPE1)	New Mexico	0.20	0.22
Wind Cave NP (WICA1)	South Dakota	0.14	0.16

Wheeler Peak Wilderness (WHPE1)	New Mexico	0.14	0.16

As shown in the Table above, the largest contribution from Louisiana sources is at the Wichita Mountains Class I area in Oklahoma in both 2002 and 2018. Louisiana is also projected to contribute a small amount of visibility degradation at Class I areas in other states as listed in Table 13. This table summarizes the projected contribution from Louisiana's emissions on visibility degradation to Class I areas for the 20 percent worst days in 2002 and 2018, as modeled by the CENRAP.[55, 56] *We are proposing to find that Louisiana's identification of sources of visibility impairment for Class I areas outside the state is acceptable.*

4. Consultation for Other State's Class I Areas

The LDEQ used the CENRAP as its main vehicle for facilitating collaboration with FLMs and other states in the CENRAP, and the VISTAS for other states outside the CENRAP to satisfy its LTS consultation requirement. This helped the LDEQ and other state agencies analyze emission apportionments at Class I areas and develop coordinated RH SIP strategies.

40 CFR 51.308(d)(3)(i) requires that Louisiana consult with other states if its emissions are reasonably anticipated to contribute to visibility impairment at that state's Class I area(s), and that Louisiana consult with other states if those states' emissions are reasonably anticipated to contribute to visibility impairment at Breton NWA. The LDEQ's consultations with other states are described in section IV.C.3 of this action. The CENRAP visibility modeling demonstrates Louisiana sources are responsible for a visibility extinction of approximately 3.5 Mm^{-1} at Caney Creek on the worst 20% days for 2002.[26] *The LDEQ consulted with Arkansas as well as Oklahoma, Texas, Mississippi, Alabama, and Florida whose emissions have a potential visibility impact at Breton. We are proposing to find that the LDEQ's consultations satisfy the requirements under 40 CFR 51.308(d)(3)(i).*

State Submittal**:** Chapters 10 and 11

The LDEQ consulted with other States/Tribes in the CENRAP and VISTAS RPOs as a primary vehicle for facilitating collaboration with FLMs and other states in satisfying its LTS consultation requirement. Louisiana's consultations with other states are discussed in section III.B.5 of this TSD. In addition to Louisiana, the LDEQ determined that Arkansas, Missouri, Oklahoma, and Texas contribute to visibility impairment at Breton and consulted with those states. The LDEQ also determined that in addition to impacting visibility at its own Class I area, sources in Louisiana also have a visibility impact at other Class I areas. Consistent with this, the LDEQ participated in consultations for Class I areas in Oklahoma including the Wichita Mountains Wilderness Area, Arkansas, Missouri, and Texas. The CENRAP visibility modeling demonstrates Louisiana sources are responsible for a relatively small visibility extinction at Class I areas other Breton. For more information about the contribution of facilities in Louisiana to visibility impairment in other states, see Table 13. Percent Contribution from Louisiana Emissions to Total Visibility Impairment at Class I areas on 20% Worst Days in section

[55] See TSD Appendix A for the CENRAP Emissions and Air Quality Modeling to Support Regional Haze State Implementation, as well as Appendix B of the LA RH SIP.

[56] See TSD Appendix A for the CENRAP Emissions and Air Quality Modeling to Support Regional Haze State Implementation, as well as Appendix B of the LA RH SIP.

IV.E.3.a.above. Also, in consulting with VISTAS, the LDEQ consulted with Mississippi, Alabama, and Florida, all areas included in the Area of Influence for Breton identified by the CENRAP for Breton (see Appendix I).

5. Mandatory Long Term Strategy Factors

40 CFR 51.308(d)(3)(v) requires that Louisiana consider certain factors in developing its long-term strategy (the LTS factors). These include: (a) emission reductions due to ongoing air pollution control programs, including measures to address RAVI; (b) measures to mitigate the impacts of construction activities; (c) emissions limitations and schedules for compliance to achieve the reasonable progress goal; (d) source retirement and replacement schedules; (e) smoke management techniques for agricultural and forestry management purposes including plans as currently exist within the state for these purposes; (f) enforceability of emissions limitations and control measures; and (g) the anticipated net effect on visibility due to projected changes in point, area, and mobile source emissions over the period addressed by the long-term strategy. For the reasons outlined below, we are proposing to find that Louisiana has satisfied some, but not all of the requirements of 40 CFR 51.308(d)(3)(v). Also, Louisiana will have to consider whether EGUs previously covered by the CAIR, whether subject to BART or not, should be controlled to ensure reasonable progress.

a. Reductions Due to Ongoing Air Pollution Programs

In addition to its BART determinations, Louisiana's LTS incorporates emission reductions due to a number of ongoing air pollution control programs.

The LDEQ considered the Tier 2 Vehicle Emission Standards in developing its LTS. Federal Tier 2 Vehicle Emission Standards for passenger cars and light trucks were fully implemented in 2009 and similar rules for heavy trucks were also implemented by 2009. These federal standards will result in reductions of emissions of PM, ozone precursors, and non-methane organic compounds. In developing its LTS, the LDEQ also considered the Highway Diesel and Nonroad Diesel Rules, which mandated the use of lower sulfur fuels in diesel engines beginning in 2006 for highway diesel fuel, and 2007 for non-road diesel fuel. These federal rules have resulted in more effective control of PM emissions from diesel engines by allowing the installation of control devices that were technically infeasible for fuels with higher sulfur content. In addition, the state will rely on federal consent decrees and implementation of the 2008 ozone standard.

As noted in the EPA's separate notice proposing revisions to the RHR (76 FR 82219) a number of states, including Louisiana, fully consistent with the EPA's regulations at the time, relied on the trading programs of the CAIR to satisfy the BART requirement and the requirement for a long-term strategy sufficient to achieve the state-adopted reasonable progress goals. In that notice, we proposed a limited disapproval of Louisiana's long-term strategy and, for that reason, we are not taking action on the long-term strategy in our proposal insofar as Louisiana's RH SIP relied on the CAIR. The docket for that rulemaking is available at Docket ID No. EPA-HQ-OAR-2011-0729. Louisiana's LTS is also deficient because it relied on deficient non-EGU BART determinations as discussed in section IV.D of this action.

In developing its LTS, Louisiana considered a number of pollution control programs required under federal regulations. These include the EPA's CAIR, which was expected to reduce Louisiana's emissions of NO_X by 39,000 tons and to reduce Louisiana's SO_2 emissions

by 43,000 tons by 2015 (from 2003 levels); the federal Tier 2 Vehicle Emission Standards for passenger cars and light trucks, which were fully implemented in 2007, and similar rules for heavy trucks that were scheduled to be implemented by 2009; and the Highway Diesel and Nonroad Diesel Rules, which mandate the use of lower sulfur fuels in diesel engines beginning in 2006 for highway diesel fuel, and 2007 for nonroad diesel fuel. These federal rules have resulted in more effective control of PM emissions from diesel engines by allowing the installation of control devices that were technically infeasible for fuels with higher sulfur content. Also, Louisiana considered National VOC Emission Standards for the following categories: Automobile Refinish Coatings (63 FR 48806), Consumer Products (63 FR 48819), Architectural Coatings (63 FR 48848), as well as several federal consent decrees, and the 2008 Ozone Standard.

Section 51.308(d)(3)(v)(A) also requires that Louisiana consider measures to address reasonably attributable visibility impairment (RAVI) in developing its LTS. Louisiana submitted a Part I Visibility Plan on October 9, 1985 that we approved on June 10, 1986 (51 FR 20967). The Louisiana SIP revision, "Protection of Visibility, Proposed Part II – Long Term Strategy," was approved by us on December 19, 1988 (53 FR 50958). The approved SIP met the requirements of 40 CFR 51.302 and 51.306. The FLMs did not identify any integral vistas in Louisiana. In addition, the Breton Class I area is not affected by RAVI, nor are any Louisiana sources affected by the RAVI provisions. Therefore, the Louisiana RH SIP does not incorporate any measures to specifically address RAVI.

b. Measures to Mitigate the Impacts of Construction Activities

40 CFR 51.308(d)(3)(v)(B) requires that Louisiana consider measures to mitigate the impacts of construction activities in developing its LTS. Construction-related activities are believed to be a small contributor to fine and coarse particulates in Louisiana. The LDEQ notes that Louisiana may require visibility monitoring in any Class I area where preconstruction and post-construction of any new source or major modification may have an adverse impact on visibility in any Class I area (LAC 33:III.504.E.3.b). In spite of a great deal of construction activity from the recovery from Hurricanes Katrina and Rita, no measurable impacts on visibility have been monitored from this activity. We are proposing to find that Louisiana satisfies this component of LTS.

Emergency Orders were issued that allowed for repair of facilities from the hurricanes; however these orders stopped short of allowing complete replacement of emissions units. If new equipment was necessary, owners/operators were required to go through the normal permitting process.

c. Emissions Limitations and Schedules of Compliance

40 CFR 51.308(d)(3)(v)(C) requires that in developing its LTS, Louisiana consider emissions limitations and schedules of compliance to achieve the RPGs. As discussed in section IV.D.3 of this proposal, the SIP does not yet contain emission limits and schedules of compliance for those sources subject to BART. The BART emission limits established by the LDEQ are an element of the LTS, and because we are proposing to find that the relevant portion of the LDEQ's BART determinations are deficient, we propose to find that this element of the LTS does not satisfy the federal requirements.

This includes enforceable emissions limitations and compliance schedules for recently adopted rulemakings, administrative orders, the issuance and enforcement of permits limiting emissions from major sources in Louisiana, state rules which specifically limit targeted emissions sources and categories, and several other ongoing air pollution control programs. The LDEQ has promulgated rules in order to administer these programs, as discussed in Chapter 11 of the LA RH SIP, especially in section 11.4.

We note that the LDEQ implements an air permitting program that includes the issuance of permits to all known major point sources in Louisiana. Each permit contains enforceable limitations on emissions of various pollutants, some of which may cause or contribute to regional haze at Breton.

d. Source Retirement and Replacement Schedules

40 CFR 51.308(d)(3)(v)(D) requires that Louisiana consider source retirement and replacement schedules in developing its LTS. The LDEQ adequately addressed how it considered source retirement and replacement schedules in the development of its LTS. Louisiana's LTS includes the promulgation of new rules for retrofit technology for existing equipment to meet requirements for new NAAQS, which will also provide visibility benefits. We are proposing to find that the LDEQ properly addressed the requirements of 40 CFR 51.308(d)(3)(v)(D) in the development of its LTS.

State Submittal**:** Chapter 11

The LDEQ stated the statutory factor of the remaining useful life of the sources is applicable only to those measures which would require retrofitting of control devices at existing sources. Louisiana's long-term strategy does not include the promulgation of new rules for visibility alone that would cause the retrofitting of control devices at this time. (Chapter 11, p. 67).

e. Agricultural and Forestry Smoke Management Techniques

40 CFR 51.308(d)(3)(v)(E) requires that Louisiana consider smoke management techniques for agricultural and forestry management purposes in developing its LTS. Where smoke impacts from fire are identified as an important contributor to regional haze, smoke management programs should be a key component of regional and State regional haze planning efforts and long-term strategies (64 FR 35736).

The EPA encourages the development of smoke management programs between air regulators and land managers as a means to manage the impacts of wildland and prescribed burning. The sources of information described above, as well as other developmental efforts currently underway, provide effective, flexible approaches to smoke management. The LDEQ considered smoke management techniques for the purposes of agricultural and forestry management in its LTS. Chapter 13 of Title 33 of the LAC contains a general prohibition on "open burning of refuse, garbage, trade waste, or other waste material." Although the LDEQ does not have the jurisdiction or authority to make any rule, regulation, recommendations, or determination with respect to agricultural burning or controlled burns of pastureland, marshland, or timberland, the Louisiana Department of Agriculture and Forestry (LDAF) does have the authority. The LDAF, in consultation with the LDEQ, is working to develop a SMP that includes measures that can be taken to reduce residual smoke from burning activities as well as a process to evaluate potential smoke impacts at sensitive receptors and guidelines for scheduling fires such that exposure of sensitive populations is minimized and visibility impacts in Class I areas are reduced. Because visibility impacts from smoke are significant in Louisiana, we propose to find that Louisiana should finalize its SMP.

State Submittal**:** Chapter 11

LDEQ states in section 11-4:

> According to the Louisiana Environmental Quality Act (La. R.S. 30:2054(B)(2)), the Louisiana Department of Environmental Quality does not have the jurisdiction or authority to make any rule, regulation, recommendations, or determination with respect to the following:
>
> Burning of agricultural by-products in the field in connection with the planting, harvesting, or processing of agricultural products.
>
> Controlled burning of cotton gin agricultural wastes in connection with cotton gin operations.
>
> Controlled burning in connection with timber stand management.
>
> Controlled burning of pastureland or marshland in connection with trapping or livestock production.
>
> Both the Louisiana Department of Agriculture and Forestry and the Louisiana State University Ag Center have Smoke Management Guidelines.

It appears from an examination of Figure 2-6 on page 2-41 of Appendix B[57] of the Louisiana SIP that area fire contributes to approximately 35% of the total annual $PM_{2.5}$ emissions for Louisiana. We consider this to be a significant contribution to the State's $PM_{2.5}$ EI. As we noted in comments we sent to the LDEQ on its draft RH SIP,[58] there does not appear to be data presented in the SIP that directly relates the influence of area sources of fire to the visibility impacts at Breton. In order to investigate the incidence of fire from biomass burning in Louisiana, we drew upon the NASA Fire Information for Resource Management System (FIRMS) database, which is constructed using satellite remote sensing data.[59] We overlaid this data with cropland data obtained from the U.S. Department of Agriculture's National Agricultural Statistics Service (NASS) for 2009,[60] which incorporates the National Land Cover Database, and plotted the result on a background image of the State of Louisiana that we obtained from the Louisiana State University.[61] All work was accomplished using ArcGIS 9.3.1 software.

The results of those maps appear in TSD Appendix E. These maps provide insight as to the incidence of biomass burning. As can be seen, biomass burning is prevalent in Louisiana. This includes burning associated with cropland (especially sugarcane), pasture and grassland; forest and shrubland; and marsh areas.

We note that both the LDAF and the Louisiana State University Agricultural Center have Smoke Management Guidelines. The LDEQ is working with the LDAF to develop a SMP for Louisiana. We appreciate the progress that has been made, and we will continue to work with Louisiana as they develop their SMP.

f. Enforceability of Emissions Limitations and Control Measures

40 CFR 51.308(d)(3)(v)(F) requires that Louisiana ensure the enforceability of emission limitations and control measures used to meet reasonable progress goals. The SIP does not yet contain emission limits and schedules of compliance for those EGU sources, if any, subject to SO_2 BART. Also, Louisiana's LTS is deficient because it relied on deficient non-EGU BART determinations as discussed in section IV.D of the proposed action. The emissions limits for these subject-to-BART sources were not included in the LA RH SIP.[62] Therefore, we are proposing to find that the LDEQ has not fully satisfied the requirements of 40 CFR 51.308(d)(3)(v)(F) in the development of its LTS.

State Submittal**:** Chapter 11

We note that in Chapter 11 of the LA RH SIP, LDEQ acknowledges that Louisiana is required to ensure that all emission limitations and control measures used to meet RPGs are enforceable (51.308(d)(3)(v)(F)

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[57] TSD for the CENRAP Emissions and Air Quality Modeling to Support Regional Haze State Implementation Plans.

[58] Letter from Mr. Guy Donaldson to Mr. James Orgeron, dated 1/31/08.

[59] FIRMS was developed by the University of Maryland with funding from NASA. http://firefly.geog.umd.edu/firms

[60] Website: http://www.nass.usda.gov/research/Cropland/SARS1a.htm

[61] LandSat Image (2005). Published by the USGS EROS Data Center and obtained from Louisiana State University.

[62] CAA 169A(b)(2); 40 CFR 51.308(e); and 64 FR 35714, at 35741.

g. Anticipated Net Effect on Visibility Due to Projected Changes

40 CFR 51.308(d)(3)(v)(G) requires that in developing its LTS, Louisiana consider the anticipated net effect on visibility due to projected changes in point, area, and mobile source emissions over the period addressed by the long-term strategy. In developing its RH SIP, the LDEQ relied on the CENRAP's 2018 modeling projections, which show that net visibility is expected to improve by 3.22 dv at Breton NWA. The CENRAP's 2018 modeling projections account for changes in point, area, and on-road and non-road mobile emissions. The results of the CENRAP's 2018 modeling projections are discussed in sections IV.E.2 and IV.E.3 of this proposed rulemaking. We are proposing to find that Louisiana satisfies this component of LTS.

The results of the CENRAP's 2018 modeling projections are discussed in TSD Appendix A.

F. Coordination of RAVI and Regional Haze Requirements

Our visibility regulations direct states to coordinate their RAVI LTS and monitoring provisions with those for RH, as explained in section III of the proposal. Under our RAVI regulations, the RAVI portion of a state SIP must address any integral vistas identified by the FLMs pursuant to 40 CFR 51.304. See, 40 CFR 51.302. An integral vista is defined in 40 CFR 51.301 as a "view perceived from within the mandatory Class I Federal area of a specific landmark or panorama located outside the boundary of the mandatory Class I Federal area." Visibility in any mandatory Class I Federal area includes any integral vista associated with that area. The FLMs for Breton have not identified any reasonably attributable visibility impairment (i.e., RAVI) from Louisiana or other U.S. sources. The FLMs for the Class I areas that Louisiana's emissions impact in other states have not identified any reasonably attributable visibility impairment caused by Louisiana sources. For these reasons, the Louisiana RH SIP does not have any measures in place or a requirement to address RAVI. We propose to find that this requirement is not applicable to the LA RH SIP at this time. This provision may be re-considered upon receipt of submittals from the LDEQ for subsequent implementation periods.

G. Monitoring Strategy and Other SIP Requirements

40 CFR 51.308(d)(4) requires the SIP contain a monitoring strategy for measuring, characterizing, and reporting of RH visibility impairment that is representative of all mandatory Class I Federal areas within the state. This monitoring strategy must be coordinated with the monitoring strategy required in 40 CFR 51.305 for reasonably attributable visibility impairment. As 40 CFR 51.308(d)(4) notes, compliance with this requirement may be met through participation in the IMPROVE network. This TSD discusses the IMPROVE network. We are proposing to find that the LDEQ has satisfied this requirement.

40 CFR 51.308(d)(4)(i) requires the establishment of any additional monitoring sites or equipment needed to assess whether reasonable progress goals to address RH for all mandatory Class I Federal areas within the state are being achieved. The CENRAP monitoring workgroup noted there was a visibility void in Southern Arkansas. An IMPROVE protocol monitor was located in north central Louisiana. $PM_{2.5}$ measurements from the Louisiana monitoring network help the LDEQ to characterize air pollution levels in areas across the state and therefore aid in the analysis of visibility improvement in and near the Class I areas. The LDEQ also commits in the Louisiana RH SIP to consider alternative approaches to evaluating visibility monitoring

obligations if that becomes necessary. We are proposing to find that the LDEQ has satisfied this requirement.

40 CFR 51.308(d)(4)(ii) requires that the LDEQ establish procedures by which monitoring data and other information are used in determining the contribution of emissions from within Louisiana to RH visibility impairment at mandatory Class I Federal areas both within and outside the state. The monitor at Breton was owned and operated by the USFWS. After this monitor was destroyed by Hurricane Katrina in 2005, the monitor was replaced and relocated nearby, by the USFWS, at Lake Catherine in St. Bernard Parish. The IMPROVE monitoring program is national in scope, and other states have similar monitoring and data reporting procedures, ensuring a consistent and robust monitoring data collection system. As 40 CFR 51.308(d)(4) indicates, participation in the IMPROVE program constitutes compliance with this requirement. We are therefore proposing that the LDEQ has satisfied this requirement.

40 CFR 51.308(d)(4)(iv) requires that the SIP must provide for the reporting of all visibility monitoring data to the Administrator at least annually for each mandatory Class I Federal area in the state. To the extent possible, Louisiana should report visibility monitoring data electronically. 40 CFR 51.308(d)(4)(vi) also requires that the LDEQ provide for other elements, including reporting, recordkeeping, and other measures, necessary to assess and report on visibility. We are proposing that Louisiana's participation in the IMPROVE network ensures the monitoring data is reported at least annually, is easily accessible, and therefore complies with this requirement.

40 CFR 51.308(d)(4)(v) requires that the LDEQ maintain a statewide EI of pollutants that are reasonably anticipated to cause or contribute to visibility impairment in any mandatory Class I Federal area. The inventory must include emissions for a baseline year, emissions for the most recent year for which data are available, and estimates of future projected emissions. The State must also include a commitment to update the EIs periodically. Please refer to section IV.E of the proposal, where we discuss the LDEQ's EI. The LDEQ has stated that it intends to update the Louisiana statewide EIs periodically. We are proposing to find that this satisfies the requirement in 40 CFR 51.308(d)(4)(v).

State Submittal**:** Chapter 6: Monitoring Strategy and Chapter 7 Emission Inventory

The primary monitoring network for regional haze, both nationwide and in Louisiana is the IMPROVE network. Louisiana intends to satisfy the monitoring requirements of Section 51.308(d)(4) through its participation in the IMPROVE monitoring network. This network is maintained through a cooperative measurement effort governed by a steering committee composed of representatives from Federal and regional-state organizations. As was true of the Breton monitor, the Lake Catherine monitor is owned and operated by the USFWS . Data produced by the IMPROVE monitoring network will be used by the LDEQ for preparing the 5-year progress reports and the 10-year SIP revisions.

40 CFR 51.308(d)(4): As 40 CFR 51.308(d)(4) notes, compliance with this requirement may be met through participation in the IMPROVE network, which applies to the Breton monitor, as well as the new monitor at Lake Catherine. (As discussed in Section III.C.1 Calculation of Baseline Conditions, data from the Gulfport SEARCH monitoring site was used as well.) The LDEQ stated its intention to rely on the IMPROVE network for complying with the regional haze monitoring requirement in our RHR for the current and future regional haze implementation periods. The primary monitoring network for regional haze in the CENRAP is

the IMPROVE network. FLMs responsible for Class I areas joined us in 1985 in response to the 1977 CAA Amendments to form the IMPROVE Program. The IMPROVE Steering Committee consists of representatives from the FLMs, the EPA, and regional-state agencies. At the direction of the National Park Service, the Cooperative Institute for Research in the Atmosphere, at Colorado State University's Foothills Campus in Fort Collins, Colorado, maintains the network plan on the IMPROVE Internet Web site.[63] The primary objectives of the IMPROVE Web site are to provide federal, state, and air quality regulatory agencies as well as the general public access to IMPROVE data, data products, and metadata fully describing the IMPROVE database, including characteristics and history of all network sites. The Web site allows users to query data, review reports, and communicate with different members of the IMPROVE Program.

40 CFR 51.308(d)(4)(i): Toward the end of the year 2000, the Breton area IMPROVE monitor was added to the monitoring network. After being destroyed during Hurricane Katrina in 2005, the Breton monitor was replaced and relocated to a site near Lake Catherine in St. Bernard Parish, Louisiana. Should the new monitor at Lake Catherine become inoperable or be shut down, Louisiana, in consultation with the EPA and the USFWS, will develop an alternative approach for meeting its visibility monitoring obligation, which may include seeking contingency funding for alternative monitoring and the reporting of that data.

40 CFR 51.308(d)(4)(ii): The IMPROVE program makes data available on the Internet via the site noted above and submits it to our air quality system. This information is used to characterize the visibility at Breton and assess Louisiana's progress toward its RPGs. The IMPROVE monitoring program is national in scope, and other states have similar monitoring and data reporting procedures, ensuring a consistent and robust monitoring data collection system.

40 CFR 51.308(d)(4)(iii): For a State with no mandatory Class I Federal areas, procedures by which monitoring data and other information are used in determining the contribution of emissions from within the State to regional haze visibility impairment at mandatory Class I Federal areas in other States. This requirement is not applicable to Louisiana because Louisiana has a Class I area.

40 CFR 51.308(d)(4)(iv): To the extent possible, Louisiana should report visibility monitoring data electronically. 40 CFR 51.308(d)(4)(vi) also requires that the LDEQ provide for other elements, including reporting, recordkeeping, and other measures, necessary to assess and report on visibility. Again, Louisiana's participation in the IMPROVE network ensures the monitoring data is reported at least annually and is available for download from the site referenced above.

40 CFR 51.308(d)(4)(v): The EI must include emissions for a baseline year, emissions for the most recent year for which data are available, and estimates of future projected emissions. The State must also include a commitment to update the EI periodically. Please refer to section III.D.3, above, where we discuss how the LDEQ has constructed its EI. The LDEQ has stated in Chapter 7, section 7.7, p. 26, of its RH SIP submittal that it intends to update the Louisiana statewide EIs periodically.

H. Coordination with Federal Land Managers

Breton NWA is a federally protected wilderness area for which the USFWS is the FLM. Although the FLMs are very active in participating in the RPOs, the RHR grants the FLMs a special role in the review of the RH SIPs, summarized in section III.H of the proposal. We view

[63] Please see *http://vista.cira.colostate.edu/improve/*.

both the FLMs and the state agencies as our partners in the RH process.

40 CFR 51.308(i)(1) requires that by November 29, 1999, Louisiana must have identified in writing to the FLMs the title of the official to which the FLM of Breton can submit any recommendations on the implementation of 40 CFR 51.308. We acknowledge this section has been satisfied by all states via communication prior to this SIP.

Under 40 CFR 51.308(i)(2), Louisiana was obligated to provide the USFWS with an opportunity for consultation, in person and at least 60 days prior to holding a public hearing on its RH SIP. In practice, state agencies have usually provided all FLMs – the Forest Service, the Park Service, and the USFWS, copies of their proposed RH SIP, as the FLMs collectively have reviewed these RH SIPs. The LDEQ followed this practice and proposed this implementation plan revision for public comment on November 20, 2007 and notified the federal land manager staff of the public hearing held on January 24 2008.

40 CFR 51.308(i)(3) requires that the LDEQ provide in its RH SIP a description of how it addressed any comments provided by the FLMs. The LDEQ has provided that information in Appendix A of its RH SIP.

Lastly, 40 CFR 51.308(i)(4) specifies the RH SIP must provide procedures for continuing consultation between the state and FLM on the implementation of the visibility protection program required by 40 CFR 51.308, including development and review of implementation plan revisions and 5-year progress reports, and on the implementation of other programs having the potential to contribute to impairment of visibility in the mandatory Class I Federal areas. The LDEQ has stipulated in its RH SIP it will continue to coordinate and consult with the FLMs as required by 40 CFR 51.308(i)(4). The LDEQ states it intends to consult the FLMs in the development of future progress reports and plan revisions, as well as during the implementation of programs having the potential to contribute to visibility impairment at Breton NWA. We are proposing to find that the LDEQ has satisfied 40 CFR 51.308(i).

State Submittal**:** Chapter 4, and Chapter 10, Section 10.3

I. Periodic SIP Revisions and Five-year Progress Reports

The LDEQ affirmed its commitment to complete items required in the future under our RHR. The LDEQ acknowledged its requirement under 40 CFR 51.308(f), to submit periodic progress reports and RH SIP revisions, with the first report due by July 31, 2018 and every ten years thereafter.

The LDEQ also acknowledged its requirement under 40 CFR 51.308(g), to submit a progress report in the form of a SIP revision to us every five years following this initial submittal of the Louisiana RH SIP. The report will evaluate the progress made towards the RPGs for each mandatory Class I area located within Louisiana and in each mandatory Class I area located outside Louisiana which may be affected by emissions from within Louisiana. We are proposing to find that the LDEQ has satisfied 40 CFR 51.308(f) and (g).

State Submittal**:** The LDEQ acknowledged this requirement in Chapter 12, page 69 of its RH SIP

J. Determination of the Adequacy of Existing Implementation Plan

40 CFR 51.308(h) requires that Louisiana take one of the listed actions, as appropriate, at the same time the State is required to submit any 5-year progress report to the EPA in

accordance with 40 CFR 51.308(g). The LDEQ has committed in its SIP to take one of the actions listed under 40 CFR 51.308(h), depending on the findings of the five-year progress report. We are proposing to find that the LDEQ has satisfied 40 CFR 51.308(h).

State Submittal: The LDEQ acknowledged this requirement in Chapter 12, page 69 of its RH SIP submittal. The LDEQ stated it intends to use the findings of the five-year progress report required under 40 CFR 51.308(g) to make a determination regarding the adequacy of this RH SIP and take an appropriate action based upon the requirements of Section 51.308(h).